Marine Engineering and Shipping Age

Volume XXVII **March, 1922** **Number 3**

Published Monthly by
ALDRICH PUBLISHING COMPANY
In Conjunction With
SIMMONS-BOARDMAN PUBLISHING COMPANY
Woolworth Building, New York
F. B. WEBSTER, Editor
H. H. BROWN, Managing Editor
S. M. PHILLIPS, Associate Editor L. S. BLODGETT, Associate Editor
W. Z. GARDNER, News Editor

Contributing Editors

Rear Admiral C. W. Dyson, U. S. N. — William Gatewood
Commander S. M. Robinson, U. S. N. — H. McL. Harding
Professor C. H. Peabody — William T. Donnelly
Captain C. A. McAllister, U.S.C.G. (Retired) — James L. Bates

WE GUARANTEE that of this issue 5,400 copies were printed; that of these 5,400 copies 4,076 were mailed to regular paid subscribers; 337 were provided for counter and news company sales; 213 were mailed to advertisers; 27 were mailed to employees and correspondents and 738 were provided for new subscriptions, samples, copies lost in the mail and office use; that the total copies printed this year to date were 16,450—an average of 5,490 copies a month.

MARINE ENGINEERING is a member of the Associated Business Papers, Inc. (A. B. P.) National Association of Periodical Publishers, Inc., New York Business Publishers' Association and the Audit Bureau of Circulations (A. B. C.).

Requests for change of address should reach us two weeks before the date of the issue with which it is to go into effect. It is difficult, and often impossible, to supply back numbers to replace those undelivered through failure to send advance notice. In sending us change of address, please be sure to send us your old address as well as the new one.

The President's Message

THE President's long-expected message was delivered before a joint session of the two Houses of Congress on February 28. As predicted in the February issue of this magazine, the President recommended a direct subsidy to all ships engaged in foreign commerce amounting to a maximum of about $30,000,000 per annum or in the neighborhood of 10 percent of the anticipated revenue from customs.

In addition to a subsidy, he recommended several forms of indirect aids which should be highly constructive without being a drain upon the public treasury. The message contains over 4,000 words, and it is an able and convincing plea for the same sort of protection for shipping that is given to our other industries. The President's plan is as follows:

"What, then, is our problem? I bring to you the suggestions which have resulted from a comprehensive study which are recommended to me by every member of the United States Shipping Board. It is a program of direct and indirect aid to shipping to be conducted by private enterprise. It is proposed to apply generally the benefits which it was designed to derive from discriminating duties to all ships engaged in foreign commerce, with such limitation on remuneration as will challenge every charge of promoting special interests at public cost.

"In lieu of discriminating duties on imports brought to us in American bottoms it is proposed to take 10 percent of all duties collected on imports brought to us in American or foreign bottoms, and create therefrom a merchant marine fund. To this fund shall be added the tonnage charges, taxes and fees imposed on vessels entering the ports of continental United States, also such sums as are payable to American vessels by the Post Office Department for the transportation by water of foreign mails, parcel posts excepted.

"Out of this fund shall be paid the direct aid in the development and maintenance of an American merchant marine. The compensation shall be based on one-half of 1 cent for each gross ton of any vessel, regardless of speed, for each 100 miles traveled. When the speed is 13 knots or over, but less than 14, two-tenths of a cent on each gross ton shall be added; for 14 knots, three-tenths of a cent; for 15 knots, four-tenths of a cent; for 16 knots, five-tenths; for 17 knots, seven-tenths; for 18 knots, nine-tenths; for 19 knots, eleven-tenths; for 20 knots, thirteen-tenths shall be added to the basic rate. For 23 knots the maximum is reached at 2.6 cents for each gross ton per 100 miles traveled.

"I will not attempt the details of requirements, or limitations, save to say that all vessels thus remunerated shall carry the United States mails, except parcel post, free of cost, and that all such remuneration must end whenever the owner of any vessel or vessels shall have derived a net operating income in excess of 10 percent per annum upon his actual investment, and thereafter the owner shall pay 50 percent of such excess earnings to the merchant marine fund, until the full amount of subsidy previously received is returned to its source. In other words, it is proposed to encourage the shipping in foreign trade until the enterprise may earn 10 percent on actual investment, whereupon the direct aid extended is to cease and the amount advanced is to be returned out of a division with the Government of profits in excess of that 10 percent. The provision makes impossible the enrichment of any special interest at public expense, puts an end to the Government assumption of all losses, and leaves to private enterprise the prospective profits of successful management.

"Of the indirect aids there are many, practically all without draft upon the public treasury, and yet all highly helpful in promoting American shipping.

"It is a simple thing—seemingly it ought not require the action of Congress—but American officials traveling on Government missions at Government expense ought to travel on American ships, assuming that they afford suitable accommodations. If they do not afford the requisite accommo-

Generated on 2024-09-12 11:28 GMT / https://hdl.handle.net/2027/mdp.39015080127403
Public Domain, Google-digitized / http://www.hathitrust.org/access_use#pd-google
Digitized by Google
Original from UNIVERSITY OF MICHIGAN

dation on the main routes of world travel, the argument that we should upbuild is strongly emphasized.

"I think we should discontinue, so far as practical, the transport services in the Army and Navy, and make our merchant and passenger ships the agents of service in peace as well as war.

"We should make insurance available at no greater cost than is afforded the ships under competing flags, and we can and will make effective the spirit of section 28 of the Jones Act of 1920, providing for preferential rail and steamship rates on through shipments on American vessels. American railways must be brought into cooperation with American steamship lines. It is not in accord with either security or sound business practice to have our railways furthering the interests of foreign shipping lines, when the concord of American activities makes for common American good fortune.

"Contemplating the competition to be met, there ought to be an amendment to the interstate commerce act which will permit railway systems to own and operate steamship lines engaged in other than coastwise trade. There is measureless advantage in the longer shipments where rail and water transportation are coordinated, not alone in the service but in the solicitation of cargoes which ever attends an expanding commerce.

"We may further extend our long-established protection to our coastwise trade, which is quite in harmony with the policy of most maritime powers. There is authority now to include the Philippines in our coastwise trade, and we need only the establishment of proper facilities to justify the inclusion of our commerce with the islands in our coastwise provisions. The freedom of our continental markets is well worth such a favoring policy to American ships, whenever the facilities are suited to meet all requirements.

"Other indirect aids will be found in the requirement that immigration shall join wherever it is found to be practical in aiding the merchant marine of our flag under which citizenship is to be sought, and in the establishment of the merchant-marine naval reserve. The remission of a proportion of income taxes is wholly compatible when the shipping enterprise is of direct Government concern, provided that such remission is actually applied to the cost of new ship construction.

"Congress has already provided for a loan fund to encourage construction. [illegible]ight well be made applicable to some special requirements in reconditioning.

"It is also worth our consideration that, in view of suspended naval construction, the continued building of merchant ships is the one guaranty of a maintained shipbuilding industry, without which no nation may hope to hold a high place in the world of commerce or be assured of adequate defense.

"A very effective indirect aid, a substitute for a discriminating duty which shall inure to the benefit of the American shipper will be found in the proposed deduction on incomes, amounting to five percentum of the freight paid on cargoes carried in American bottoms. The benefits can have no geographical restrictions, and it offers its advantages to American exporters as well as those who engage in import trade."

The Great Lakes-St. Lawrence Waterway

JUDGING from editorial comment in the newspapers of the interior, the proposed Great Lakes-St. Lawrence waterway has considerable support in at least eighteen of the middle-western states. President Harding endorsed the project in a speech before the National Farm Conference on January 23 and it has since been announced that Secretary Hughes has been directed to negotiate a treaty with Great Britain under which the United States and Canada can jointly undertake the building of a shipway from the lakes through the St. Lawrence river to the Atlantic. Representative Mapes of Michigan has introduced a bill in Congress authorizing the President to spend $100,000 to defray the expenses of the American members of an international commission to work out the plans for a thirty-foot channel and for the development of water power.

If this proposed waterway is constructed, the water power that it can develop will be its real justification; for the cost of construction and maintenance of a canal must be considered in the total cost of transportation over a waterway just as the cost and maintenance of a road bed must be added to the price of transportation of a railroad. It is certain that shipping could defray neither the cost nor the maintenance of this project because the saving that is possible in avoiding a transfer of cargo at the seaboard would be largely offset by the extra time that a ship would lose in making its way at a reduced speed through the locks and narrow channels of such a long waterway. However, as a power project, it might be a good investment and on this subject some interesting figures are given.

Col. W. P. Wooten, Corps of Engineers, U. S. A., and W. A. Bowden, chief engineer, Department of Railways and Canals, Canada, who were appointed by their respective governments to investigate the possibilities of this improvement, report that $252,728,200 will be necessary for the complete improvement for navigation purposes and the development of approximately 1,464,000 horsepower delivered at the switchboard. Mr. Paul T. Brady of the Westinghouse Electric and Manufacturing Company figures that the 1,464,000 horsepower, which is equivalent to about 1,100,000 kilowatts, would deliver in 7,000 of the 8,760 hours in a year 7,700,000,000 kilowatt hours to sell. He estimates the fixed charges, maintenance and amortization charge to pay the debt in fifty years at $13,049,232 per annum, which, if taxes are eliminated, would make the cost of a kilowatt hour something less than 2 mills.

To distribute this power over a 300-mile radius, it is estimated that $75,000,000 additional would have to be spent for transmission lines and towers and that this cost would have to be financed by private interests. Assuming $9,000,000 as a fair charge per annum to take care of the interest, depreciation, operation, maintenance and amortization of the $75,000,000, the cost of the power would be about 3½ mills per kilowatt hour as compared with 1 cent per kilowatt hour that it costs New York today to generate power from coal.

If the above figures are approximately correct, and the project is completed, it appears that the lake seaports would

Generated on 2024-09-12 11:26 GMT / https://hdl.handle.net/2027/mdp.39015080127403
Public Domain, Google-digitized / http://www.hathitrust.org/access_use#pd-google
Digitized by Google
Original from UNIVERSITY OF MICHIGAN

be presented with an outlet to the ocean which would undoubtedly have a stimulating effect on shipping and the industrial development of the interior. The people of the Middle West are not apt to feel the vital interest which they should in an adequate merchant marine, notwithstanding the fact that American shipping is just as important to the welfare of those states as it is to the seaboard. The construction of this waterway might do much to bridge the gap in the shipping perspective now existing between the seaports and the interior.

A Brighter Outlook

THE month of February marked a definite improvement in the shipping and shipbuilding situation. Numerous inquiries for the chartering and building of passenger ships were current in January but, outside of a few reconditioning jobs, such as the *Manchuria, Mongolia* and *Ruth Alexander* (ex-*Callao*), nothing of importance had actually developed. It is common knowledge that a thorough search has been made for passenger tonnage, and it has been found that vessels of this class ready for service under the American flag are not to be obtained in the market.

The first contract for the year for the construction of two new passenger vessels was awarded to the Wilmington plant of the Pusey and Jones Company early in February. These vessels, which are to be 330 feet long, 58 feet beam and of 2,750 gross tonnage, are for the Seaboard Bay Line. Each ship will have 175 staterooms and special bedrooms, all of which will be fitted with the most up-to-date improvements.

The big event of the month was the awarding of the contract to recondition the *Leviathan* to the Newport News Shipbuilding and Dry Dock Company. This is the greatest single step that the new Shipping Board has made toward placing our merchant marine on an equal basis with our foreign competitors. It is highly significant, indicating, as it does, that the board is confident that Congress will support the shipping legislation that is to be recommended by the President and that the appropriations requested by the board will be granted.

Another thing, it is apparent that, although the *Leviathan* will be second to none as a passenger liner when completed, she will require two other ships to work in combination with her. Two such ships of express speed are available, the *Agamemnon* and *Mount Vernon*. Both of them can be reconditioned in eight months' time at a total cost of less than the sum that will be spent on the *Leviathan*. The present indications of heavy passenger travel during the season of 1922 show that good use can be made of these vessels.

The passage of subsidy legislation will undoubtedly release several orders. The American Bureau of Shipping reports that there are substantial inquiries for at least a dozen sea-going ships, most of which are passenger vessels, and that there is a decided shortage of this type of craft in the United States. While inquiries are not necessarily contracts, yet, when the Bureau uses the term "substantial inquiries" it undoubtedly means that the contract plans of these proposed ships have been submitted to the Bureau for advice and suggestions relating to future classification.

The Shipping Board at the time of this writing has placed 46 idle ships in commission since January 1, and it is reported that it contemplates allocating 40 more in the near future. A number of these have been chartered on the bare boat plan, thus assuring the board of a profit rather than a loss on their operation.

Another forward step is the betterments now under way on the State ships allocated to the United States Lines. The *Lone Star State* and the *Peninsula State* when completed will carry first and third class passengers only. These ships should be highly successful as their third class accommodations are the equal in location and quality to the second class accommodation on other liners, while the first class accommodations are better than can be obtained elsewhere for the same price.

The *Centennial State, Old North State* and *Panhandle State* are being converted to cabin ships carrying one class only. By placing a convertible upper and lower berth in each stateroom, thus berthing four instead of two per room, it will be possible to halve the price of the passage. These ships will certainly appeal to persons in moderate circumstances and will no doubt make it possible for many to travel who otherwise would not.

Advertising American Passenger Liners

IN view of the attacks that have been recently made in Congress against the Shipping Board policy of advertising American passenger ships, we are inclined to wonder whether the destructive criticism that certain newspapers—notably the important dailies of New York City—have directed against any attempt to build up an American merchant marine along the lines successfully adopted by our foreign competitors is not having a most decided and injurious effect upon some of our legislators.

The notorious fact that a number of our patriotic public officials travel on foreign passenger liners every chance they get ought to be a sufficient reason to any fair minded Congressman that the general public, who are not supposed to be so well informed on matters affecting the general welfare of the nation, should be advised through high class advertising of their own passenger ship services. If public officials prefer foreign ships, it is all the more important to direct the attention of the traveling public to the fact that they own a number of high class safe and comfortable ships themselves and that the Shipping Board, through some of the best known steamship lines, is operating these ships for their own benefit.

We don't want to hog all the commerce for American ships, either freight or passenger, but we do want a fair share. Government statistics show that approximately 250,000 Americans travel by sea from the United States every year. Suppose one-half or 125,000 of these travelers attempted to patronize their own ships, what would be the consequence? Nothing less than that the shipyards of this country would be busy creating new tonnage. The allied trades would be working overtime furnishing equipment and fittings for the best ships that the world has ever seen. Yes, and of far more importance than this, our present naval strength in desirable convertible merchant tonnage would begin to assume something like a proportion to the 5-5-3 naval ratio that our statesmen have made the general public believe indicates the comparative strength of our Navy.

Generated on 2024-09-12 11:20 GMT / https://hdl.handle.net/2027/mdp.39015080127403
Public Domain, Google-digitized / http://www.hathitrust.org/access_use#pd-google
Digitized by Google
Original from UNIVERSITY OF MICHIGAN

The Navy Yards Are for the Navy

WE have just witnessed a very narrow escape from a serious injury to our merchant marine. Although most everyone knows that the recent reduction in our naval strength makes an efficient merchant marine doubly important, yet we have seen a determined attempt by the politicians of Massachusetts to deliberately hold up the reconditioning of the *Leviathan* in the hope that the Boston Navy Yard might obtain this work through a questionable estimate.

That a bid from a navy yard is no more nor less than an estimate is evident from the following quotations from a letter written by Edwin Denby, Secretary of the Navy, to the *New York American* under date of November 8, 1921:

"A bid by a private firm is a guaranty of the performance of the work at a price named and within a time stipulated.

"A bid from a navy yard is the estimated cost of the work. If work is awarded a navy yard after an estimate, the actual cost of the work is charged, whether the same be greater than or less than the estimated cost. Estimates ordinarily run fairly close, say, within about 10 percent; but in a big reconditioning job where the actual amount of work necessary can only be revealed after opening up work and uncovering all defects, it is difficult to make an estimate that will fall within 10 percent of the actual cost.

"Furthermore, the stipulated time for performance of work for other departments of the Government must always be subject to the condition that urgent naval work shall take precedence even if such precedence causes failure to perform the other Government departments' work within the time stipulated.

"As the total cost of reconditioning the *Leviathan* will probably run somewhere between $6,000,000 and $8,000,000, it will be seen that an estimate submitted by a navy yard would not give the Shipping Board the exact information which they desire as to cost and time of performance of this work. The necessity for economy is so great that the authorities of the Shipping Board do not feel that they could take the chance of overrunning the estimated cost by possibly $500,000 or $600,000. They must have a guaranteed total expenditure."

The Secretary of the Navy might have gone even farther than this; he might have added that the Merchant Marine Act both in spirit and in letter directs the Shipping Board to get the Government out of the shipping business; he might have added that such work in a navy yard does not include overhead charges on the plant investment or insurance which must come out of the taxpayers' pockets and he might have added that the organization of a navy yard, while excellent for naval work, is not nearly so well adapted for merchant work.

It is true that it has been the practice of the navy yards to charge a certain overhead on private work, including most everything except plant investment and insurance, but labor organizations interested in navy yard work backed by the American Federation of Labor, have demanded that other than naval work be given to the navy yards in order to allow the continued employment of the men and that all overhead charges arising from the military functions of these establishments, as well as those arising from equipment made idle by past failure to keep it in production, be eliminated in figuring the costs.

It seems, therefore, that, in spite of the fact that there should be as many men employed whether a ship is repaired at a navy yard or a private plant, an effort is to be made to urge legislation to keep the Government in the shipping game. It is of vital importance to encourage private capital to invest in shipping and shipbuilding, but this will be a hopeless task if the Government, backed by the public treasury, is to compete against it.

We want an adequate American merchant marine and an efficient American Navy. To accomplish this, we must have shipyards and navy yards, but we must remember that ships are not built so that shipyards may have work nor are warships constructed so that navy yards may repair them. As the general welfare of our shipyards must depend on the success of the merchant marine so must the amount of work available for navy yards depend on the size of the navy. Special jobs in the navy yards can only hope to delay the final day of adjustment at the expense of the shipyards and the taxpayers. The navy yards are for the Navy and they should so remain.

The Naval Morale

THEY have served up the Navy on a silver platter as a sacrifice on the altar of Peace but no murmur of complaint has been made by the naval officers who have been trained to submit as well as to command. Our Navy with its splendid tradition has no finer example of the self restraint of its entire personnel than has been given during the last few months while the fate of its latest and most powerful ships has hung in the balance.

It is only human to consider selfish interests and these men have known full well that this great reduction in warships means far fewer opportunities for promotion. Yet they have not complained because they also have known that the continuation of the competitive building of armament means ruin and disaster to the world.

However, the stopping of competitive building does not mean that we are not to have a Navy that is reasonable in size. By the terms of the treaty we will still have 18 battleships, 316 destroyers, 35 cruisers, 147 submarines, 196 auxiliaries and 152 small vessels. In addition to this, a number of scout cruisers and aeroplane carriers will be added as the treaty provides for them. This is the size of a navy that the Disarmament Conference considered necessary to meet the minimum requirements for the safety of the United States.

To return to our subject, is the naval personnel which has been reduced to 6,129 commissioned officers and 96,300 enlisted men to be subjected to wholesale slaughter or are the ships that we are allowed to retain to be efficiently manned? If Congress is not satisfied with the drastic cut that has already been made and decides to lay up the remainder of the fleet or keep it in an undermanned condition, then an unjustified strain will be placed on the morale of the Navy which would amount to nothing less than criminal negligence in the present state of world civilization.

Generated on 2024-09-12 11:26 GMT / https://hdl.handle.net/2027/mdp.39015080127403
Public Domain, Google-digitized / http://www.hathitrust.org/access_use#pd-google
Digitized by Google
Original from UNIVERSITY OF MICHIGAN

Why We Should Have a Subsidy

By "Old Scotch"

The greatest question before the American shipping public is still the proposal to devise some means whereby we can operate our immense merchant fleet, in being, successfully. All other questions are subordinated until we find the solution of how our American ships can be kept on the seas.

AT this writing, early in February, the President has not made his expected visit to Congress for the purpose of addressing them on the subject of aids to the merchant marine, but there seems no doubt but that he will do so in the near future. The several committees of experts have made their reports on the various phases of the subject and everybody interested is ready for the initiative to be taken.

The enemies of the measure have started in to oppose it and are evidently paving the way for a vigorous campaign against it. Already editorials have appeared in certain daily newspapers opposing whatever form the proposed legislation may take. These "patriotic" effusions are so uniformly opposed to anything beneficial to the American merchant marine, that it is really quite amusing to observe the various lame excuses given for opposing this particular class of proposed legislation. To bolster up their views (probably made abroad) they have their various correspondents interview certain gentlemen who are opposed to anything in which they are not personally interested and quote at length their opinions as the voice of the people rising up in indignation against this approaching legislation to aid shipping, whatever it may be. In other words, they do not know anything about the subject, nor do they know what form of relief is to be asked for, but on general principles they are "agin" it.

Nevertheless and notwithstanding, some measure of relief for shipping is bound to pass and at this session of Congress, too. The reasons for such relief are so impelling, and will be presented so forcefully, that any of our national legislators who are not violently and unreasonably prejudiced can and probably will support it. There are so many viewpoints which can be taken on the whys and wherefores of this proposed legislation that regardless of party affiliations or local interests any member of the House or Senate can find it to the advantage of his constituency to support the measure.

Merchant Shipping a Means of National Defense

Let us consider it for this article solely as a matter of national defense—all parts of the country are vitally interested from that standpoint. The Limitation of Armaments Conference, now so happily terminated, has, by its agreement to limit the number of capital ships, made merchant shipping of double the importance that it was before. With a limited number of battleships, every large passenger or freight vessel becomes potentially a national asset for purposes of defense. While we are all in more or less accord as to the advisability of reducing competitive armaments, there are but few of us sufficiently idealistic and optimistic to think that all wars are over. Far from it, and particularly will we find it fallacious, if we do not from now on maintain a robust American merchant marine. With our war vessels reduced to the agreed minimum, if we allow our merchant vessels to disappear from the seas, we will be as helpless as a one-arm man in a street brawl, and the brawlers will know that the one-arm man has large sums of money in his pockets.

No matter in what form future warfare may develop, whether on land, on sea, or in the air, merchant shipping must necessarily be a vital element for the transportation of troops, supplies and munitions of whatever kind may be used. Even if this country is not directly involved, the warfare may be between countries upon whom, unless we keep up our own shipping, we have been forced to depend for ocean transportation. We only have to harken back to 1914 and 1915 to understand how such a condition may well arise and what serious consequences it could bring upon our whole business interests.

Notwithstanding the many beneficial international agreements entered into at the recent conference, we must not forget that the use of the submarine was very slightly curbed. Should we maintain but a very small merchant marine, a few energetic enemy "subs" could very quickly put it out of business.

Merchant Marine Naval Reserve Proposed

One proposal of combining our naval resources with our merchant fleet has already been made, and it is well worthy of the attention of our law makers. Briefly, the plan is that instead of cutting down our existing naval personnel, by summarily discharging about one-third of the commissioned officers and enlisted men, as is now being seriously considered by Congress, in order to reduce maintenance expenditures proportionate to the reduction in capital ships, it is proposed that they be placed in what would be termed a Merchant Marine Naval Reserve.

The proposal is to pay these officers and men half of their present naval salaries from appropriations for the national defense, providing they serve on merchant vessels and receive the other half of their pay from the shipowners or operators. This would accomplish a saving of about twenty-five millions of dollars in the annual naval appropriation and would make it unnecessary for Congress to appropriate money as a subsidy fund to shipowners, in order to overcome the differential between American wage rates and the wage rates of our competitors. This, it is estimated, would cost for an adequate American merchant marine, about twenty-five millions of dollars. The Government would by such a procedure save fifty millions of dollars annually and would not have lost any of its effective fighting strength, so far as trained naval personnel is concerned.

As the Navy must operate the merchant marine in time of war, it would by this method have a splendid trained personnel to operate merchant vessels in a very efficient manner, and thus avoid many of the sad experiences which we had during the past war. Some of our merchant crews during that period were composed of the worst bunch of foreign highbinders and bolshevists ever gathered together since the days of Captain Kidd and his "regular" pirates. The surest way, therefore, to make our merchant crews thoroughly American, with innate ideas of discipline and loyalty to our flag, is to adopt some such method as this.

Of course there would have to be limitations on the use of these young naval officers, as the transition from purely war duties to merchant duties could not be made over night. It has therefore been proposed that only naval officers who

Generated on 2024-09-12 11:25 GMT / https://hdl.handle.net/2027/mdp.39015080127403
Public Domain, Google-digitized / http://www.hathitrust.org/access_use#pd-google
Digitized by Google
Original from UNIVERSITY OF MICHIGAN

are under thirty years of age be taken over, and that with the understanding that they be placed under trained merchant skippers, chief engineers and first mates for a period of five years, until "they know the value of a dollar and how to make it instead of spend it," as one well known shipping man recently expressed it.

ONE HUNDRED PERCENT AMERICAN CREWS

The merchant marine would be the gainer by injecting such an element of selected and well trained youngsters in it to replace all aliens. Of course no one would think of displacing that fine array of genuine Americans who have in the past five or six years taken up a seafaring life, but they unfortunately are not sufficient in number to man a real American merchant marine of the proper size to meet our demands both for trade and for national defense. With the addition of the naval contingent we would, in a few years, have a trained personnel in our merchant marine which would be second to none in the world, as it would then be truly "one hundred percent American."

As many of us can well remember, it was only as recently as the Spanish war when the Navy staff was manned by a heterogeneous collection of enlisted men almost of 57 varieties. One ship, and a flagship at that, which the writer knows of in particular, actually had representatives of 26 different nationalities in her crew of 350 men. One wag (American, of course) suggested that a sign "English spoken here" be posted on the berth deck. Now the Navy, according to the latest reports, is composed of over 99 percent American citizens, and its efficiency is as nearly perfect as it can be made. If reductions must be made in this well-trained force of men, what better place to put them than on our merchant vessels?

OUR MERCHANT MARINE CREATED FOR COMMERCE AND NATIONAL DEFENSE

We must not forget, in this connection, that the Jones bill committed this country to a policy of maintaining a merchant marine adequate to its needs both for commerce and national defense. The necessity for our merchant marine to develop and maintain our commerce overseas has been plainly demonstrated by many able statesmen and writers. Not so much has been written as to its value and absolute necessity for our national defense and it has been the endeavor in this brief dissertation to point out some of the salient features along these lines.

Viewed as a strictly business proposition, there are some well meaning economists who might satisfy themselves that to subsidize or give preferential treatment to merchant shipping, as such, is not based on their ideas of logic. Unfortunately there are quite a number of followers of such theories who do not have the breadth of vision to see that a nation's shipping must not be weighed in the scales of economic suppositions. To any such, let them adopt their theories as they may on that ground, but in the light of past history (which is always the best precursor of what may happen in the future) let them not forget that the merchant marine must be maintained as an element of national defense, and a more important element at this time than ever before.

It has been clearly demonstrated that we cannot operate merchant ships in competition with our rivals, for the plain reason that our standards of wages and living are the highest in the world, and we just don't want to lower them for any part of our people, until we are compelled to do so. We find that we can overcome this difference in expense by the Government contributing from thirty to fifty millions a year to private shipping enterprise. It is necessary for our national safety that we keep up our merchant shipping, so let us pay out this money and not call it a SUBSIDY—call it a national defense fund, but make it available just as soon as possible, before we slip back to our pre-war state of unpreparedness.

Water-Borne Commerce Shows Marked Upward Trend

THE water-borne foreign trade of the United States showed marked improvement for the month of December, according to figures given out by the Shipping Board. Excluding bulk oil moved in tankers, the total overseas traffic increased 609,500 tons, or 21 percent over the November figures. Exports alone showed an increase of 32 percent. This is the first upward trend in our shipping figures since the coal movement in June.

The Shipping Board maintains statistics of the water-borne foreign trade of the United States measured in long tons weight and divided under three heads, the over-seas cargo movement, the bulk oil movement in tankers, and the Great Lakes movement.

The total imports decreased 9 percent and the total exports increased 12 percent compared with the previous month, but if compared with the same month in the previous year, there is shown a 6 percent loss in imports and a 40 percent loss in exports, or a total decrease in the year of 26 percent, or 2,400,000 tons.

The Great Lakes traffic, with the closing of the season, declined about 48 percent, from 1,409,190 tons in November, to 730,639 tons in December. November, with the influx of Canadian grain, marked the peak of the import movement, while August shows the peak of an export movement which included, during the year, more than two million tons of American grain. December imports were 610,456 tons, 37 percent less than November, and exports were 120,183 tons, 72 percent less than November. American vessels carried 96 percent of the imports, 70 percent of the exports and 92 percent of the total cargo tonnage.

Tanker cargoes in December aggregated 2,397,988 tons, an increase of 4 percent over November. Imports were 1,883,316 tons, two thousand and sixty-five tons less than November, and exports were 514,672 tons greater, an increase of nearly 22 percent over November. American vessels carried 86 percent of the imports, 34 percent of the exports and 75 percent of the total tanker cargo tonnage.

The important portion of our foreign commerce, that carried in overseas cargo vessels, increased from 2,900,000 tons in November to 3,500,000 tons in December, and marks the first gain in our overseas commerce since the flurry of May and June caused by the miners' strike in England. Further, this gain was entirely in the exports, as the imports fell off slightly. The total export overseas, exclusive of oil, amounted to 2,521,132 tons, or an increase of 32 percent over the previous month, although still 45 percent less than the export trade of the same month a year ago. Including both exports and imports, our overseas dry cargo trade in December was 21 percent above the previous month and 41 percent less than that of December, 1920. In this trade American ships carried 27 percent of the exports, 34 percent of the imports, and 29 percent of the total trade.

Handling of the George Washington Appreciated

APPRECIATION of the efficient and capable manner in which the *George Washington,* operated by the United States Lines for the Shipping Board, was handled on her recent trip from New York to Bremen during several days of one of the most severe storms that has ever been experienced on the North Atlantic Ocean is contained in resolutions received by the Shipping Board, signed by Alexander P. Moore, owner of the *Pittsburgh Leader;* Robert Goelet, Henry Kaufmann, Adolph Vogel and J. M. H. Lidgerwood.

Generated on 2024-09-12 11:36 GMT / https://hdl.handle.net/2027/mdp.39015080127403
Public Domain, Google-digitized / http://www.hathitrust.org/access_use#pd-google
Digitized by Google
Original from UNIVERSITY OF MICHIGAN

The Shipping Subsidies of Japan and France

By Winthrop L. Marvin*

Two nations besides Great Britain—Japan and France—have made long and extensive use of shipping subsidies for the encouragement of their merchant marines. Postal subventions, general subsidies and even shipbuilding bounties have been practiced by these two countries for many years. How have they succeeded?

JAPAN was chiefly a nation of junks when in 1896, after her victorious war with China, she began to give vigorous national aid to her shipbuilding and navigation. There were then, it is true, a few Japanese ocean steamers, but they aggregated only a little over 100,000 gross tons—five years before the Chinese war produced its sudden need of transports, Japan had only thirteen ocean steamers of 27,700 gross tons. The war had brought an impressive object lesson to the Island Empire, and it had resolved never to be a shipless land again.

The Japanese government in 1896 frankly modeled its shipping acts on both British and French precedents. To its national ocean mail lines Japan, exactly as Great Britain had been doing since 1839, gave generous direct subsidies or subventions, and not content with this and realizing that it was not sufficient, Japan also provided bounties for the encouragement of shipbuilding and mileage subsidies for general shipping, exactly as France had done.

Shipbuilding in Japan was then a small, precarious industry. Most of the Japanese ocean vessels had been bought from Europe. The first Japanese shipbuilding bounty law, enacted in 1896 to be effective for fifteen years, gave 20 yen (about $10) per gross ton for the construction in Japan of seagoing ships of more than 1,000 tons gross register, and in addition a bounty of 5 yen ($2.50) for each indicated horsepower of machinery. Under this encouragement ocean steamers of increasing size began to be constructed, and Japan developed the excellent shipyards which for many years since have been producing not only her merchant vessels but her men-of-war.

Navigation Bounties for All Ocean-going Vessels

General navigation bounties based on French policy were provided in the acts of 1896 for all ocean-going vessels of the Japanese merchant marine—the rate being at so much per gross ton per hundred miles run, as in original French practice. For the further encouragement of native shipbuilding foreign-built vessels, except the very latest, not more than five years of age, were excluded from the benefits of these navigation subsidies.

In addition the Japanese government subsidized very liberally new regular passenger, mail and fast freight steamship services to Puget Sound, San Francisco and Australia, another line to Europe and subsequently a line to South America. This policy gave to Japan within a few years an excellent fleet of thoroughgoing liners and cargo steamers, and at the same time created highly efficient construction yards and an adequate force of naval architects, engineers and workmen. When Japan suddenly attacked Russia in 1904, the Japanese government was abundantly supplied with transports and auxiliary vessels to supplement its navy, and also reserve officers and men of the merchant service and admirable facilities for the reconditioning and repair of its battleships and cruisers. As a means of quickly providing a great merchant marine, invaluable in peace or war, the Japanese subsidy policy had proved wonderfully successful. Appropriations for this policy in the Imperial budget for the year ending March 31, 1909, included the following in yen (yen equals 50 cents):

	Yen
Shipbuilding bounties	1,995,400
Navigation bounties	3,483,955
Subsidy to European line	2,673,895
Subsidy to San Francisco line	1,013,880
Subsidy to Seattle line	654,030
Subsidy to Australian line	425,782
Subsidies to various lines to Korea, Dalny, China, and other Asiatic and domestic ports	2,118,713
Total	12,365,655

Subsidies Constantly Maintained

That is to say, in 1909 the Japanese government was expending upwards of $6,000,000 in subsidies and bounties for the encouragement of its shipbuilding and navigation—or about five times the total ocean mail disbursement of the United States. On one line of three ships to San Francisco in 1910 Japan was expending $1,340,000—in fact, making up its commercial deficit and sustaining three admirable ships of its naval reserve which could not possibly have lived without it. These three Japanese steamers, by the way, were at that time the fastest and most formidable auxiliary cruisers on the Pacific Ocean.

As Japan's merchant marine has steadily developed through the years, there have been changes in the details of legislation, but the principle of national aid by subsidy has been constantly maintained. After a considerable fleet of cargo steamers had been created, the navigation bounties to ships of this type were gradually discontinued, and the ships were left to rely on their low wage costs of operation. Japanese shipbuilding bounties are still in force, though suspended during the world war for the time being. The national steamship services like those to Europe and to the Pacific coast of the United States are still in receipt of subsidies that rank among the highest in the world. Here are the records of the marvelous growth of the Japanese merchant marine under a policy similar to that recommended for the American Congress:

Year	Tons
1895	301,101
1900	574,557
1905	873,552
1910	1,149,222
1914	1,708,386
1915	1,826,068
1916	1,847,453
1919	2,325,266
1920	2,995,878
1921	3,354,806

What subsidy has done for the Japanese merchant marine is one of the most significant events of history. With no such ocean-going traditions and no such commercial experience as the Americans, the Japanese before 1914 had far

*Vice-president and general manager of the American Steamship Owners' Association, New York.

Generated on 2024-09-12 11:49 GMT / https://hdl.handle.net/2027/mdp.39015080127403
Public Domain, Google-digitized / http://www.hathitrust.org/access_use#pd-google
Digitized by Google
Original from UNIVERSITY OF MICHIGAN

outstripped us in the development of a modern overseas merchant fleet—because theirs had been a protected industry while ours had not been.

France, from whom Japan took her shipbuilding bounties and navigation subsidies, has made a long, brave effort to evolve a merchant shipping of high character. Originally, many years ago, France pursued a free ship policy of depending for her tonnage on ships from foreign yards. This free ship experiment, of course, proved to be a dismal failure, paralyzing French shipyards without adding any substantial new tonnage to the merchant marine. In fact, for years the entire French shipping amounted to only about 1,000,000 tons, coastwise and overseas tonnage both included.

French Adopt Subsidy Principle in 1881

In 1881 the French people, chagrined at long failure, resolved upon the adoption of a comprehensive system of construction and navigation bounties, and more liberal postal subsidies than had been paid before. In their zeal the French included sail vessels within the benefits of the law and at first provided a bounty for them that was actually more generous and effective than aid given to steamers. A larger subsidy to sail vessels than to steam craft was a manifest economic blunder which developed a beautiful sail fleet but did not symmetrically increase the merchant marine. The French subsidy law of 1881, amended in 1883, was still further amended in 1902 and again in 1906.

French subsidy and bounty laws, so frequently altered, have gradually become more efficient and productive. The French budget for 1908 provided 10,400,000 francs ($2,700,200) for shipbuilding bounties and 31,500,000 francs ($6,079,500) for general navigation and shipowners' subsidies. French shipping was in a relatively flourishing condition and gained markedly in tonnage, just before the outbreak of the great world war.

The backbone of the modern French mercantile marine consists of the two great postal steamship companies, the Compagnie Générale Transatlantique and the Messageries Maritimes. These are among the oldest and most famous of the overseas steamship companies of the world, and have been very liberally supported throughout the years by the French government and people. It is in the fleets of these two great companies that French maritime achievement is seen to the best advantage—great, fast steamers, admirably officered and manned. In 1909 the French government was paying a total amount of $13,423,737 in encouragement to its merchant marine, of which somewhat more than $5,000,000 was devoted to the postal subsidies.

Now Third Largest Shipping Nation

Those who speak of the French subsidy system as a failure are unaware of the real facts. There have been many defects of detail in French subsidy laws in the past, but these have gradually been eliminated and the French policy of national aid has proved more and more notably successful. There can be no gainsaying the official records of the recent growth of the French mercantile marine which from 1890 on are as follows:

Year	Tons
1890	1,045,102
1895	1,094,752
1900	1,350,562
1905	1,728,038
1910	1,882,280
1914	2,319,438
1915	2,285,728
1916	2,216,643
1919	2,233,631
1920	3,245,194
1921	3,652,249

Here are actual figures which speak far more eloquently than any irresponsible anti-subsidy propaganda. From a negligible factor in 1890, France has steadily advanced until she stands at present as one of the three greatest merchant shipping powers of the world—her tonnage in 1921 exceeding Japan's and placing her next only to Great Britain and the United States of America. Norway, with all her traditional talent for shipbuilding and navigation, has not of recent years succeeded in increasing her merchant tonnage as notably as has France, the Norwegian merchant marine in 1921 standing at 2,584,058 tons gross register, more than a million tons below the total of France. Of course, both France and Norway suffered terribly from the ravages of the German submarines.

Foreigners Fear an American Subsidy

Most of the assertions which we have been accustomed to hear in the United States, that the French subsidy policy was not productive, refer to the earlier and experimental period of French legislation. Those who have implicitly accepted these statements from overseas have simply fallen victims to interested propaganda. Foreigners who have marked well the amazing development of manufactures under a protective policy in the United States, live in mortal dread of the application of a protective policy to American shipbuilding and navigation. They are appalled at the prospect that such a policy in a few years might make the United States the greatest shipbuilding and navigating power in the world. Hence the publication and distribution of a vast library of misinformation on the subject, to muddle the minds of the American people.

The frequent assertion that France has spent millions in subsidy, with only the result that her merchant marine is as little as ever, is an example of the truth and accuracy of this kind of propagandist literature. Of course, it is a lie out of whole cloth, but it is astonishing how many American public men and editors have allowed themselves to be deceived by it without making any investigation of their own.

Both Japan and France have conspicuously succeeded in their shipping subsidy undertakings—Japan the more quickly and easily because she is an island empire, with a redundant population, rapidly developing her own industries and commerce. Indeed, her government has made the encouragement of shipping its chief, dominant thought for the past twenty years, while to France the development of her merchant marine has been an important, but not an all-pervading, thought. Yet of the two France is today the greater maritime power, measured by the tonnage of her merchant fleet.

Neither Japan nor France begins to have the resources of the United States for the creation and maintenance of an immense merchant trading tonnage. Our commerce is incomparably greater. So are our ports and seacoasts, our resources for shipbuilding, our historic fame for skilful navigation. Let us not forget that within the memory of many men now living our chief competitor, Britain, frankly acclaimed our shipowners, officers and seamen as the most efficient and successful men of their calling in the world. That was in the years when there was something like fair play for the American merchant flag on the long routes of ocean commerce. That fair play there has not been for a decade preceding, and almost six decades following, the Civil War.

Model Marine Insurance Law for District of Columbia Passed by House and Senate

Consideration of the bill providing for a model marine insurance law for the District of Columbia was begun in the House on February 13 and continued on February 15, when it was set aside for other business. The bill was passed by the House on February 22. It had previously been passed by the Senate.

Generated on 2024-09-12 11:25 GMT / https://hdl.handle.net/2027/mdp.39015080127403
Public Domain, Google-digitized / http://www.hathitrust.org/access_use#pd-google
Digitized by Google
Original from UNIVERSITY OF MICHIGAN

Congress and Shipping Board Have Begun to Act

Leviathan Contract Awarded at Last—Shipping Board Appropriation Assured—Entire Government Fleet Offered for Sale

By Harold F. Lane

THE contract for the reconditioning of the *Leviathan* was awarded, at a special meeting of the Shipping Board on February 15, to the Newport News Shipbuilding and Dry Dock Company, Newport News, Va., in spite of a vigorous campaign on the part of labor organizations, Massachusetts Congressmen and others to force the board to have the work done at the Boston Navy Yard.

The board stated that the approximate cost of placing the giant liner in commission would be $8,200,000. Of this amount $5,595,000 will be spent for general reconditioning and conversion of the vessel into an oil burner and $515,000 for repairs to machinery. Both of these contracts were awarded to the Newport News Shipbuilding and Dry Dock Company. Gimbel Brothers of New York were awarded the contract for the equipment of the steward's department and for a library, the price being $551,000.

Gibbs Brothers, engineers, of New York, were retained by the board to supervise the reconditioning of the ship, their fee being $182,000. William Francis Gibbs of this firm was formerly chief engineer in charge of construction for the International Mercantile Marine Company of New York but severed his connection with that corporation to join with his brother, Frank H. Gibbs, in forming a new company to supervise the work. They will employ a staff of assistants. In awarding this contract the board made a saving of $28,000 as the International Mercantile Marine Company was to receive the sum of $210,000 according to the terms of a contract it had with the board. This contract was recently cancelled by mutual consent.

The balance of the $8,200,000, namely $1,357,000 will be expended for moving the ship to the contractor's yard, insurance covering this removal, new anchors and chains, moving the vessel to dry dock, dry docking, trial trip, and maintenance and guarding of the ship for 14 months during reconditioning.

Work to Start Immediately

Work on the *Leviathan* will be started immediately and she will proceed at once under her own steam to the shipyard at Newport News. The contract was signed by Joseph W. Powell, president of the United States Shipping Board Emergency Fleet Corporation, and Homer Ferguson, president of the Newport News Shipbuilding and Dry Dock Company.

As soon as she has been reconditioned at the Virginia plant the *Leviathan* will be taken to the Boston Navy Yard where she will be dry-docked and her bottom scraped and painted.

At the time bids were asked for—last November—on this vessel the Secretary of the Navy stated that his department did not have an appropriation to prepare an estimate, did not have the facilities to carry out this type of work and could not submit a bid upon which a binding contract could be made. For these reasons the Navy did not figure on the work. Secretary Denby reaffirmed his position in a conference with Chairman Lasker of the Shipping Board on February 14.

The board issued a statement saying it was obliged to award the contract to the Newport News Shipbuilding and Dry Dock Company because:

1. February 15 had been fixed months ago as the last day when the bids put in by the competing contractors would remain open.

2. The bids were taken at the low dip of the market and undoubtedly if new bids were taken again a considerable increase in the estimates, probably more than a million dollars, would result.

3. If the matter were put over until the Navy could submit an estimate, which it has informed the board is not desirable or practicable, it would take that department at least 60 days in which to prepare an estimate, as it occupied that period of time for the successful contractor at a cost of $30,000 to make up its proposal. If the Navy therefore was to bid on this work now, it would mean the loss of the Spring and Summer trade in 1923, which in money would amount to more than a million dollars, which in addition to increased costs would greatly raise the total.

4. The Newport News Shipbuilding and Dry Dock Company were the lowest bidders.

The President, Chairman Wesley L. Jones of the Senate committee and Chairman William S. Greene of the House committee on merchant marine affairs have approved the action of the Shipping Board in awarding the contract to the Virginia corporation.

Yard Ready to Start Work

The Newport News Shipbuilding and Dry Dock Company, which recently reduced its forces, expects to take on 1,500 to 2,000 additional men to handle the *Leviathan* work, making a total of about 5,000. The company, in anticipation of the contract, started dredging a place alongside one of its piers early in February for the *Leviathan* to berth. Schedules for new fittings and equipment amounting to over $1,000,000 that are necessary for reconditioning the vessel have been prepared.

The necessity for making complete new plans and specifications directly from the ship, which was done at a cost of $250,000 after the Germans had demanded $1,000,000 for the plans, has made it possible to get a lump sum bid for the work, the first time on a reconditioning job of this magnitude, it is said. Usually work of this kind involves a large sum for extras, but because of the completeness of the specifications it was possible to get eight lump sum bids. Officials of the board consider that the expenditure of $250,000 on the plans will, therefore, save perhaps $2,000,000 in the total cost of doing the work.

The highest possible standards are to be adopted in the reconditioning. Entirely new electric lighting, heating and plumbing systems are to be installed and it is believed that the safety will be greatly increased by the plans for eliminating one-half of the watertight doors below the waterline.

All first-class cabins are to be equipped with telephones and it is expected that by the time the ship is ready for service in May, 1923, the art of wireless telephony will have made such advances that it will be possible to send and receive messages from the cabins to and from any part of the world. Chairman Lasker says the boat will be "the finest hotel in the world on land or sea."

Boston Navy Yard Wanted the Contract

Much pressure was brought to bear on the Shipping Board and the President to have the work done at Boston, particularly since the reductions in force that were made at the various navy yards, but the President has been adhering to the policy of "less government in business" and

Generated on 2024-09-12 11:27 GMT / https://hdl.handle.net/2027/mdp.39015080127403
Public Domain, Google-digitized / http://www.hathitrust.org/access_use#pd-google
Digitized by Google
Original from UNIVERSITY OF MICHIGAN

moreover he took the position that the work would relieve just as much unemployment in one community as in another. The Mayor of Boston had been in Washington trying to influence the giving of the work to the Charlestown navy yard, the Massachusetts legislature had sent a memorial to Congress, the labor unions had been most active, and Representative Dallinger of Massachusetts had succeeded in securing the adoption by the House of an amendment to the appropriation bill for the Shipping Board and the Fleet Corporation which would require giving the navy yard an opportunity to estimate on the work. Senator Lodge of Massachusetts made an effort to have a similar amendment added in the Senate, but after he had failed to win support for it he accepted a substitute suggested by Senator Jones of Washington which contained the words "unless the President shall otherwise direct." The President had previously placed himself on record as opposed to giving the work to a navy yard in a letter to the Massachusetts Congressman who had asked that the work be given to the Boston yard.

With this amendment the bill was passed by the Senate on February 11, but as the bill still had to go to conference it was obvious that it could not become a law by February 15. The labor organizations had organized a lobbying committee of 30 members the night before, with President Samuel Gompers of the American Federation of Labor at its head, and each member called on three senators to urge them to vote for the "Lodge amendment." The modification suggested by Senator Jones enabled a good many of them to comply, who might otherwise not have done so. It was then impossible for the Shipping Board officials to say that they had any clear mandate from Congress, as it was obvious that the bill could not be passed by February 15, and they had previously indicated that in the absence of an expression by Congress the full responsibility would be upon the board for getting the work done in the most economical way.

I. M. M. Releases Board From Contract

Shortly before the announcement of the award the fact was made public that the International Mercantile Marine Company had reluctantly, at the urgent request of the Shipping Board, released the board from an option or contract entered into with former Chairman Payne, under which it was to supervise the reconditioning and later operate the ship. The board took the position that there was no binding contract but at its request the company agreed to waive the claim.

Shipping Board Appropriation Assured

The bill carrying the appropriations asked by the Shipping Board and the Emergency Fleet Corporation has been passed by both the House and the Senate without reduction of the amount, with various provisions restricting the expenditure of the funds which were included in amendments adopted by the House but not by the Senate, which required that the bill be sent to conference. The appropriation for the Fleet Corporation for the fiscal year 1923 as provided in the bill is $50,000,000 for operations and $50,000,000 for the settlement of claims, of which $30,000,000 is to be immediately available. A provision in the bill to make available the balance not used by July 1 of the $55,000,000 which under the previous appropriation bill may be used by the board out of the proceeds of the liquidation of assets was struck out on a point of order in the House but was left in in the Senate bill.

The appropriation for the Shipping Board proper is $459,000, including $20,000 for the investigation of foreign discrimination against vessels and shippers of the United States and for the investigation of transportation of immigrants in vessels of the Shipping Board.

Debate Brings Out Criticisms

In the House there was much debate and criticism of the board because of the salaries paid to officers and other transactions, but in the Senate the debate was principally on the question of the reconditioning of the *Leviathan*.

The House amendment proposed by Representative Dallinger of Massachusetts provided that no part of the appropriation shall be expended for the "purchase, acquirement, repair, or reconditioning of any vessel, commodity, article or thing," which at the time can be manufactured, produced, repaired or reconditioned for a less cost in any United States Government navy yard or arsenal, provided that this limitation shall only apply to vessels while in the harbors of the United States and all expenditures in connection with such work are to be considered in estimating the cost." An amendment proposed by Representative Graham of Illinois that not more than $1,000,000 shall be spent for the repair, reconditioning or rebuilding of any one ship was rejected after a long debate.

The bill as reported by the House committee provided that not more than 13 officers or employees, including seven attorneys, should be paid a salary in excess of $11,000. The last appropriation bill limited this number to six and the purpose of the bill was to allow the payment of $11,000 to seven attorneys. After a long debate, an amendment proposed by Representative Byrns of Tennessee was adopted, limiting the number of salaries in excess of $11,000 to six as at present and striking out the provision for seven attorneys. In the Senate, however, the committee proposal was adopted. An amendment limiting to $350,000 the amount to be expended as compensation for attorneys, regular or special, proposed by Representative Jones of Texas, was rejected in the House, as was one proposed by Representative Davis of Tennessee to reduce the appropriation for claims to $25,000,000 instead of $50,000,000.

Among the amendments adopted by the House was one by Representative Walsh of Massachusetts limiting the salaries to be paid by the board to $25,000 a year. A similar proposal was rejected, however, by the Senate. Another, proposed by Representative Black of Texas, provides that no claim shall be paid out of the amount provided unless the Shipping Board shall find that such claim grew out of an agreement, express or implied, entered into with the board or the Emergency Fleet Corporation or their legal representatives.

Publicity and Advertising Matter

An amendment proposed by Representative Walsh, which was adopted, provides that no part of the funds appropriated shall be expended "for the preparation, printing, publication or distribution of any bulletin, newspaper, magazine, journal or other periodical, or for services in connection therewith, not including, however, the preparation and printing of documents and reports authorized or required to be issued by law." This was struck out in the Senate.

An amendment proposed by Representative Byrnes of South Carolina to limit the expenditures for advertising to $500,000 a year was rejected after considerable debate, by a vote of 49 to 45.

Board Offers to Sell Entire Fleet

The United States Shipping Board, through the Emergency Fleet Corporation, has announced its intention of asking bids for the purchase of any or all of its steel cargo vessels, steel passenger and cargo vessels, steel tankers and the other vessels comprising its entire fleet, bids to be submitted by March 14. The ships are to be advertised for sale so that it will be possible to sell any of them promptly, if any offer is made, although it is expected that the best market will not be developed for the ships until the prospects for ship subsidy legislation are known more definitely. Purchasers who are willing to take a "gamble" on the prospect of a subsidy, however, it is said, will probably be able to purchase ships now at a better price than they could get by waiting.

Generated on 2024-09-12 11:26 GMT / https://hdl.handle.net/2027/mdp.39015080127403
Public Domain, Google-digitized / http://www.hathitrust.org/access_use#pd-google
Digitized by Google
Original from UNIVERSITY OF MICHIGAN

The Fuel Question

By Robert E. Annin

In actual steamship operation the most expensive single item of cost is fuel; and toward economy in this regard there is a continuous struggle. The cheapness with which coal has been produced in the United Kingdom has been perhaps the largest factor in England's commercial supremacy, giving cheap fuel for her factories, cheap bunkers for her ships, a needed bulk export commodity to balance her inward traffic and a commanding control over the world's bunkering stations. Previous to the war Great Britain and her dependencies provided about 65 percent of the bunker coal used and controlled about 80 percent of the bunkering stations. Today, however, through the regular processes of economic selection, oil has won the premier position as fuel for ship propulsion and in this article its advantages are discussed.

IN fuel for sea-propulsion economy is possible in three directions. First there is the choice of the ship, which must be made in view of size and speed, as well as the nature of the service; the former choice depending largely upon the type of hull, engines and boilers. There follows the question of the *kind* of fuel to be used—coal or oil; and the *quality* of the fuel is of prime importance; for both vary in their thermal efficiency or power producing qualities (per unit of weight) according to their degree of conformation to certain established standards. Again comes the question of fuel *management* which is the responsibility of the engine department. The economical or wasteful use of fuel is a vital point in the records of the engine room.

Beyond this is the prevention of crooked practices by which the ship is overcharged for bunkers; or fuel is dishonestly removed from the ship and sold through collusion between the engine room and the shore—practices often covered up by doctoring the daily records of consumption. Such procedure applies also to provisions and other stores; and points another direction in which the selected personnel of a regular service gives a great advantage to established lines.

As to the choice between coal and oil for steam production at sea, the developments of the past few years seem conclusive wherever conditions approach equality.

Oil Versus Coal

In a preceding article, reference was made to the large proportion of oil-burning ships constructed in English yards during the year ending June 30 last. According to Lloyds, this amounted to 58 percent of the total deep sea tonnage built, and at that did not include ships converted from coal to oil during the same period. Considering the comparatively recent advent of oil as a power producer, so rapid a stride to a commanding position, against such an entrenched rival as coal, must be considered as closely approaching a demonstration of superior efficiency.

Ever since the use of steam began to be recognized as a substitute for animal energy, industrialism has been a constant, and progressive struggle for the economical production and application of power. The steam engine long preceded Watt. As early as 1698 Savery produced an engine for pumping mines, which worked, but was not a real success owing to its enormous fuel cost. Watt (1763) separated the condenser from the cylinder, thus conserving temperature in the latter, greatly reducing fuel cost; and so lifting the steam engine out of the experimental stage.

From then until the beginning of the present century coal was King. But with the discovery of certain grades of mineral oil in the southwestern portion of the United States, in Mexico, and the Malay Archipelago, a new fuel, more economical in production, transportation and application, became commercially available. Oil, by its success as a cheap power producer, has in the interim achieved such a position that it is difficult to see how it is to be displaced. Whether used for production of steam, or in internal combustion engines, no effective competition is in sight, unless vast progress shall be made in the transportation and storage of electrical energy produced by water power.

For reasons which are not far to seek, in every industry where conditions have been approximately even fuel oil has steadily won its way. Compared with coal its efficiency is about three to two—that is two tons of oil will produce the same energy as three tons of coal. There are claims that a result of two to one has been attained, which is possibly true under ideal conditions of oil use. For locomotive use an English railway claimed a test result of slightly better than two to one. Impartial judgment, however, must regard the former comparison as a safer working basis. Hence on a basis of first cost it would appear that whenever the price per ton of coal is two-thirds of the price of oil the first cost of the power unit will be the same whichever fuel is used.

Special Advantages of Oil Fuel

But oil has special advantages beyond its thermal efficiency. It is more easily and cheaply produced, loaded, unloaded and transported. It is practically self feeding, while coal must be painfully and expensively "stoked." It leaves no ashes or clinkers which must be re-handled and disposed of. All these are vital factors entering into fuel cost.

For land uses, such as railways and factories the result has been a progressive displacement of coal by oil wherever the point of consumption was not too far removed from the source of oil supply. Previous to the war, and under a regime of low ocean freights, even Great Britain, with no native oil and with her abundant and cheaply worked coal, was perceptibly swinging toward the use of fuel oil. In that period two large English railways—the Great Eastern, and the London, Brighton and South Coast—installed oil burning apparatus on their locomotives; the advantage, even over coal produced at their own doors, being then decisive. With the swift advance, not only in first cost but especially in ocean freights which followed, conditions compelled a return to coal until a more normal relation between the two should be established. But wherever fuel oil is available its commercial progress as a power producer has been steady and continuous.

For sea use the advantages of oil are accentuated by two considerations which cannot apply (at least, in equal degree) to railways or factories. The latter must, within certain narrow limits, stand the waste of bringing fuel from the source of supply to point of demand. The deep-sea steamer owing to her mobility can and does save a large portion of this waste. Her fuel expense is an enormous proportion of operating cost and she will bunker where bunkering is cheapest.

With the spread of oil stations over the maritime map, and the growth of cheap transport in tankers the advantage

Generated on 2024-09-12 11:28 GMT / https://hdl.handle.net/2027/mdp.39015080127403
Public Domain, Google-digitized / http://www.hathitrust.org/access_use#pd-google
Digitized by Google
Original from UNIVERSITY OF MICHIGAN

to the lines which have terminals near any oil fields, or to tramps which accept business all over the world, is obvious. They can obtain at a minimum cost that which constitutes their most expensive single item of operation; and can often bunker "for the round" with double advantage.

Gain in Cargo Carrying Capacity

This suggests a second special advantage which steamers find in the use of this class of fuel. If a vessel of 6,000 tons capacity uses 1,500 of this for fuel and stores, she has 4,500 tons capacity left for revenue producing cargo. But if she uses but 1,100 tons for fuel and stores, her potential revenue capacity is increased by 400 tons. Further, apart from dead-weight lift, coal will occupy a space of about 42 cubic feet per ton, which otherwise would be available for cargo; while oil can be placed in ballast tanks (or double bottoms) where it will utilize room which would otherwise be wasted, and leave a corresponding space for stowage of cargo.

Clearly this decision as to oil or coal must regard two main factors.

1. The relative costs per ton, of each, *"under the boiler."*
2. The revenue value of space and lift capacity released by the smaller bulk and weight of the oil.

The latter of course will vary with prevailing rates and market conditions. If cargo is so scarce that full capacity cannot be utilized, this factor may not influence the calculation. Otherwise it must, and frequently does, prove decisive when the price of oil is greatly higher than that of coal.

Reduction in Personnel and Betterment of Working Conditions

Again, the reduction in *personnel* which oil permits is not only important as reducing expense for pay and subsistence but should be welcomed as doing away with that imitation of perdition, the old-fashioned stoke hole. None who have not seen it can have any conception of its horrors; and probably no one can appreciate the suffering which it causes unless he has had personal experience. From the humanitarian point of view alone, therefore, the steady trend toward oil fuel is a subject for congratulation. Anything that tends to lighten the lot of the merchant sailor (none too bright at best) should be welcomed.

To return to the commercial side. It is far cheaper and cleaner to put oil into tanks through a pipe than to load and trim coal into bunkers by dumping and shovelling. The saving of a steamer's time also is of great importance and constitutes an important economy in itself. For bunkering at sea (as in the case of warships, or for relief of a vessel short of fuel) there is no comparison. Coaling at sea is impossible except under favorable conditions owing to obvious dangers. But sea transfer of oil has been easily and safely accomplished through flexible tubes in quite heavy weather.

Costs of Coal and Oil Compared

If a comparison be made as to relative expense of coal and oil on any given ship the compelling reasons which give preference to the latter can be seen at a glance.

If a cargo ship can make a given voyage complete in forty days on 1,500 tons of coal, or 1,000 tons of oil, carrying a cargo of grain at 25 cents per 100 pounds, her expense of fuel and stoking would be about as follows, (with oil 50 percent above coal in price):

Coal

Cost—1,500 tons coal @ $5.00 per ton.....	$7,500.00
Wages and subsistence, 9 stokers, 40 days @ $1.85 per day	666.00
Loss in gross revenue, 1,500 tons @ $5.60...	8,400.00
	$16,566.00

Oil

1,000 tons oil @ $7.50 per ton	$7,500.00
Wages and subsistence, 3 fire tenders, 40 days @ $1.85	222.00
Loss in gross revenue 1,000 tons @ $5.60 per ton	5,600.00
	$13,322.00

Here is a direct saving of over $3,200, or say $80 per day. Counting 300 days as the steamer's active year, the direct gain would be $24,000, without counting the saving in bunkering and gain in turn-around.

This is a simple comparison for a small cargo steamer and the saving, while material, will not compare in amount with larger and swifter freighters, to say nothing of large express passenger liners. So far as the latter are concerned oil seems on the point of monopolizing the field; new construction running almost entirely to oil, while coal burners already in service are being rapidly converted.

Savings Effected on the Olympic As An Oil Burner

The latest of these, concerning which details are available, is the White Star steamer *Olympic,* the largest British built passenger ship afloat.

The daily coal consumption of the *Olympic* was about 900 tons. Of oil she burns 600 tons per day, making a saving of say 2,000 tons on her eastward voyage, or 4,000 tons on a round trip.

As a coal burner the *Olympic* carried 246 firemen, working under almost intolerable conditions. Under oil, 60 men attend to the burners under healthy and comfortable conditions. This means economy in human lives. Stokers under the old system were constantly collapsing, frequently under physician's care, and as a class were driven to dissipation, and often to suicide, in the vain effort to forget their miseries.

As to expense, the wages and subsistence of 186 men (say $4,000 on an 18-day round trip) are eliminated—an annual saving (counting 300 days' service) of about $70,000—even under the English scale and with sterling at a discount. But this is not all. The *Olympic* required about 9,600 hours' labor for coaling, and everything had to give place to this vital operation. At that it took between four and five days. She can now oil in eight hours with the labor of ten men, (80 hours' labor) without dust or dirt, and without interfering with any other work. It is merely a matter of pumping from a barge to the ship's tanks. The ship's tanks carry about 7,500 tons and, owing to reduction in quantity and compactness of stowage, the space saved is released for uses producing or directly tributary to revenue.

Economies Compel Use of Oil on Liners

All in all it is obvious that the new liners are being equipped with oil apparatus, and that old ones are being rapidly converted because the resultant economies are simply compelling. Even British owners, who have no home supply of oil and enormous supplies of cheap coal, realize that they cannot meet oil competition with coal. Among the large liners converted to oil are (in addition to the *Olympic*) the *Aquitania, Mauretania* and *Berengaria* of the Cunard Line; and, of new express passenger steamers now building, it is said that practically all are designed for oil. The *Scythia* and *Caledonia* are examples.

It therefore appears that oil has won the premier position through the regular processes of economic selection.

So much for the steamer, on which the test between the two fuels has been chiefly made. When, and if, the internal combustion engine shall supplant the steam engine for sea propulsion (a condition which appears probable) oil seems likely to hold the entire field. For the internal combustion engine can beat the oil burning steamer as badly as the latter has beaten her coal burning rival.

Generated on 2024-09-12 11:26 GMT / https://hdl.handle.net/2027/mdp.39015080127403
Public Domain, Google-digitized / http://www.hathitrust.org/access_use#pd-google
Digitized by Google
Original from UNIVERSITY OF MICHIGAN

The innate conservatism of the trade has made it cautious in accepting the motorship as a proved success but the results of continuous demonstration must ere long be generally conceded. The motorship appears to loom up as the ocean vehicle of the future.

GROWING IMPORTANCE OF THE MOTORSHIP

It is not necessary to go into more figures. It is enough to say that the motorship, by using about one-third the quantity of oil, can achieve the same speed as an oil burning steamer of equal size. Without going fully into details of various well established records the history of a Swedish motorship (the *Stureholm*) may be quoted.

The ship is of 7,800 tons deadweight capacity and when bunkered for 10,000 miles has a net cargo capacity of 7,200 tons—600 tons only being occupied by fuel and stores. Three consecutive voyages showed an average speed of just under ten knots on a daily consumption of fuel oil of 10¼ tons. An oil burning steamer of the same capacity and speed would be doing well to get off with 35 tons of oil per diem, and her cargo capacity would be reduced, not by 600 tons but by at least 1,700 tons, to take care of fuel and stores.

Not that the internal combustion engine has yet reached a point of development where the road lies straight and clear before it. Expense of original installation, weight, excessive pressures and temperatures are all handicaps at the present stage; and the success thus far has been achieved in spite of these drawbacks.

Sir Owen Phillips (himself an owner of motorships) expresses the belief that the internal combustion engine, as we know it today, will not eventually prove able to hold the field; but that engineers will evolve something giving double the power for half the weight and size.

ECONOMY IN THE USE OF OIL IMPERATIVE

That the utmost economy in the use of the world's oil supply is imperative is the gospel preached by all whose opinions on this point are entitled to consideration.

Considering its constantly widening use for power and light and the fact that as a lubricant there is no substitute for mineral oil, estimates that the world's supply can last only thirty to fifty years are disquieting. But this is a far cry. The need of saving every dollar on operation is an immediate and imperative need of the shipowner of today. Fuel is his greatest and most important item. Therefore the important point for the moment is this.

In view of the demonstrated economy of oil as an ocean fuel, coal can hardly come back to its old supremacy until, and unless, the price difference in its favor shall be sufficient to offset the superior economy and efficiency of its rival. This condition may arise whenever from reduction of supply or increase of demand the first cost of oil shall be raised to a point which shall neutralize its advantages in other respects. No such situation is now in sight.

SUPREMACY OF OIL NOT MENACED

Fuel oil is really a by-product in the production of gasolene, naphtha, benzine and the other products which utilize the more volatile elements of the crude. With the immense increase of demand for these, the production of fuel oil must continue at a high rate under present conditions, even though steamers are lying idle in every great port of every maritime nation. The United States Shipping Board (for instance) is said to have about a thousand steamers laid up; while the Clyde and Forth are lined with dead tonnage.

As long as this continues oil is likely to be an even fiercer competitor of coal than in the past. With continued production and slack demand the prospects are for continued low and even lower prices.

For a present comparison, good bunker coal is now quoted at 32/6 per ton (say $7.15) at Dartmouth, England. At Hampton Roads the price is about $4.75, plus trimming in (say 30 cents per ton). At New York similar quality is obtainable at about $5.50, to which the cost of trimming must be added (say 60 cents) making the cost (trimmed in) $6.10 per ton.

At this level (New York) fuel oil at $9.00 per ton would involve no larger original outlay than coal, and all the incidental savings would be net. In view of the latter (and varying of course with the individual ship as well as other conditions) oil would have to go to 2½ to 3 times the per ton cost of coal before these advantages would be neutralized.

Should the present situation persist, it would not be surprising if the per ton price of fuel oil should crowd down much nearer to the price of coal than it has ever been before. The inevitable result on the fuel question is too obvious to require comment.

Shipping Board Seeks Cancellation of Contracts With Japanese Steamship Lines

THE preferential traffic contracts between the Chicago, Milwaukee & St. Paul and the Great Northern and Japanese steamship lines, covering export and import traffic to and from the Orient, which the Shipping Board is insisting that the railroads abrogate in order to give Shipping Board vessels a chance for a share in the traffic, were the subject of an informal conference at the Shipping Board offices on February 2 attended by Chairman Lasker and Commissioners Thompson and Lissner of the Shipping Board, Chairman McChord and Commissioners Campbell and Potter of the Interstate Commerce Commission, Ralph Budd, president of the Great Northern, H. E. Byram, president, and R. M. Calkins, vice-president, of the Chicago, Milwaukee & St. Paul, and representatives of the Seattle Chamber of Commerce.

The Shipping Board reaffirmed its position that all preferential contracts between railroads and foreign steamship companies must be abrogated and stated that it could not enter into a contract with the rail lines to take the place of the foreign contracts. The railroad officers expressed their desire to aid the American merchant marine but reaffirmed their previous position that the abrogation of the contracts would only deprive them of revenue with no assurance that the business would go to the American boats, because of the control of a large part of the traffic by the Japanese soliciting agencies and the probability that the contracts would be transferred to Canadian lines.

It is understood that Mr. Budd proposed as a compromise that the contracts be abrogated and that the road agree to turn over to the Shipping Board vessels one-half of the unrouted traffic, giving the other half to Japanese lines in return for the business which they can give to the road. Commissioner Potter is said to have taken the position that the railroad officers would not be warranted in voluntarily giving up the contracts and thereby sacrificing their revenues. Members of the board claim that they have legal authority to compel the cancellation of the contracts but have preferred to try to persuade the roads to cancel them. The railroad representatives were to meet again with members of the board on March 1 with a view to giving their final answer at that time.

The executive committee of the Tacoma Chamber of Commerce has sent a telegram to the Shipping Board in which it "views with alarm" the reported insistence of the board on the abrogation of the traffic contracts between the Chicago, Milwaukee and St. Paul and the Great Northern railroads and Japanese steamship lines.

Generated on 2024-09-12 11:20 GMT / https://hdl.handle.net/2027/mdp.39015080127403
Public Domain, Google-digitized / http://www.hathitrust.org/access_use#pd-google
Digitized by Google
Original from UNIVERSITY OF MICHIGAN

The New Uniform Export Bill of Lading

Affects Property Transported by Rail and Ship from United States to Points in Non-Adjacent Foreign Countries

By Waldon Fawcett

POSTPONED for one month at the request of the carriers, there will become effective on March 15 a new export bill of lading prescribed by the Interstate Commerce Commission. This is the culmination of a movement initiated more than a year ago. Representations on the subject have been made to the Interstate Commerce Commission by various shipping interests and whereas the rules and regulations prescribing the form of the new through export bill of lading do not fully meet the approval of all interested parties there is reason to believe that the plan worked out at Washington is a fairly satisfactory solution in behalf of the standardization which is admittedly desirable.

The new through export bill of lading is designed for issuance by carriers subject to the Interstate Commerce Act for application to the transportation of property, in connection with ocean carriers whose vessels are registered under the laws of the United States, from points in the United States designated under the provisions of Section 25 of the Interstate Commerce Act to points in non-adjacent foreign countries. In due course, an order will be promulgated by the Interstate Commerce Commission designating points on the lines of carriers enumerated at which information relative to the handling of export shipments by common carriers by water in foreign commerce shall be maintained and at which will be issued through bills of lading in connection with ocean carriers whose vessels are registered under the United States laws.

In ordinary practice it is customary for carriers to furnish bills of lading in connection with transportation over their lines, although large shippers, as a matter of convenience, frequently provide their own. In Paragraph 11 of Section 20 of the Interstate Commerce Act it is specifically provided that any carrier receiving property for transportation "shall issue a receipt or bill of lading therefor." Confirming this obligation the Supreme Court of the United States said in the case of Atchison, Topeka and Santa Fe Railway Company versus United States: "Whatever transportation service or facility the law requires the carrier to supply they have the right to furnish." In this same connection the Commission has assumed that a carrier could refuse to use a bill of lading tendered by a shipper which was of an unusual size or style or did not correspond with the terms of the lawfully published and filed bill.

Reasons for Uniform Bill of Lading

The investigation by the Interstate Commerce Commission which led up to the promulgation of the new export bill of lading was inspired to a considerable extent by widespread expressions of dissatisfaction with the conditions heretofore existing. In the course of a recent hearing before the Merchant Marine Committee of the United States House of Representatives on the subject of theft, pilferage, non-delivery, breakage, etc., in import and export shipments there was, on the part of a number of witnesses, severe criticism of conditions governing bills of lading. At that hearing ocean carriers and especially the United States Shipping Board were accused of putting in their bills of lading provisions exempting them from nearly every sort of liability.

C. E. Dobson, managing director of the Southern Lumber Exporters' Association, declared that almost every ship operator has his own bill of lading and that no two of them are alike. Furthermore, he declared that they were changed from time to time. His comment was that, if the Shipping Board would prescribe a standard bill of lading for all its operators and use a special form for each of the principal commodities, eliminating the "excess verbiage" and "unthinkable provisions," it would be a great source of relief to shippers. Frank C. Overton, president of the National Association of Waste Material Dealers, ventured to hope that some day the nation would have a standard bill of lading, worded in accordance with the law and free from individual and arbitrary clauses. He particularly attacked the practice whereby a steamship company stamps on its bill of lading a clause in effect as follows: "Steamer not responsible for marks nor for numbers of bales and broken bales or short weight on account of spilling or breaking of bands during the transfer."

Multiplicity of Reservations Objectionable

Various commercial organizations have charged before the Congressional committee that, under stress of war-time transportation conditions, various shipping companies have inserted in their bills of lading reservations that are in open conflict with the Harter Act, approved February 13, 1893. This is the statute which declares to be null, void and of no effect any words or clauses inserted in bills of lading designed to relieve the shipping interest from liability for loss or damage arising from negligence, fault or failure in proper loading, stowage, care, delivery, etc. Spokesmen for the organization of shippers and receivers of goods urged that Congress, in the interest of avoidance of misunderstandings, exert influence to induce the steamship companies to adopt a standard form of bill of lading. Or, if, because of varying port conditions in certain countries it be not practicable to concentrate on one standard form, then, as an alternative, there should be several standard forms adopted designed to meet local conditions.

In the recent representations at the Capitol with respect to the rights that should be guaranteed to the patrons of ocean tonnage, it has been emphasized that whereas every shipper and consignee is not posted as to his legal rights under a bill of lading, nevertheless an ocean bill of lading is supposed by the average merchant to be a negotiable document. He accepts drafts and draws drafts with an ocean bill of lading as security, and, if the supposed obligations of such a bill of lading are not fulfilled, there is proportionate embarrassment to the shipper or receiver of goods who has placed implicit faith in the document. One argument put forth at Washington was that there is as much reason for a standard bill of lading applicable to foreign commerce as for a standard form of insurance policy such as is now in use in the United States.

At one of the sessions of the Congressional Committee on Merchant Marine there was sharp debate on the question whether steamship companies had, in recent years, with unwarrantable frequency and without proper notice changed their bills of lading. Friends of the shipping companies on the committee contended that diligent inquiry showed that no steamship companies have changed their forms of bills of lading in the last three years. The antagonists were not prepared to say that the printed forms had been altered but made the point that in recent years there has been an increase in the number of rubber stamp imprints placed on bills of

Generated on 2024-09-12 11:37 GMT / https://hdl.handle.net/2027/mdp.39015080127403
Public Domain, Google-digitized / http://www.hathitrust.org/access_use#pd-google
Digitized by Google
Original from UNIVERSITY OF MICHIGAN

lading, such rubber stamp surcharges constituting, in their judgment, changes in the contracts.

DIFFICULT TO INTERPRET

Critical fire was also centered, in the course of the recent discussions at Washington, on the alleged complexity of bills of lading. It was charged that the complexity of the bills in use is increasing rather than diminishing and that there are incorporated a large number of clauses printed in very small type and difficult to interpret. In the course of remarks at the Capitol, Mr. Charles E. Herrick, representing the Institute of American Meat Packers, took the ground that a complicated bill of lading that attempts to defy the Harter Act really injures the shipping interests in that it discourages newcomers in the export field. He recounted that there are many beginners in export trade, located at inland points, who are not versed in the Harter Act and no more are their attorneys. Such persons are apt to accept as gospel all the exemptions that a shipping interest may write into a bill of lading. The shipper, thus confronted, is apt to swallow his loss, but he is also likely to abandon all further effort to cultivate export trade.

In the discussions in Congressional committee much has been made by spokesmen for inland shippers of the difficulties of procuring ocean bills of lading at interior points. Shippers in the interior have testified that they have repeatedly asked for copies of the ocean bills of lading that were to govern particular contracts and have been as often told that these cannot be furnished because the local transportation officials profess ignorance of what form of bill of lading is to be used when the goods reach the seaboard. The shipper feels therefore that he is compelled to accept a contract the terms of which he does not know and cannot know. The interior shippers demanded that there be some provision of law that the freight contract on a shipment from the interior shall govern the terms of the bill of lading rather than be governed by a bill of lading issued subsequent to the receipt of the goods on board the ocean carrier and when it is, of course, too late for the shipper to withdraw them.

SHIPPING EXECUTIVES BELIEVE NEW BILL WILL ELIMINATE FRICTION

Representatives of the ocean carriers, notably Mr. F. A. Ryan of the International Mercantile Marine Company and J. E. Waldorf of Chicago, have taken issue in Congressional conference with the interior shippers who complained of inability to obtain copies of ocean bills of lading. It was insisted that a shipper located, say in Chicago, should have every facility to ascertain details as to bills of lading inasmuch as the Chicago agents of the shipping companies have on file not only copies of the ocean bills of lading but copies of the connecting line bills. Mr. Ryan stated that, if an interior shipper made a shipment on a through bill of lading, his through bill would provide that it was subject to all the terms and conditions of the local bill of lading in use at the time that the shipment was made. This, he thought, would automatically mean that the date of the through bill of lading would govern the conditions of the local bill of lading which are in force on the day on which the through bill of lading is signed. The shipping executives have further stated in recent conversations with leaders of Congress that they have hopes that all friction and resentment on the part of shippers will be eliminated by the new through bill of lading which is presented by the Interstate Commerce Commission and the form of which was carefully gone over by committees of various trade associations as well as by committees representing the steamship lines before it was submitted to the Commerce Commission.

The present move on the part of the Interstate Commerce Commission constitutes a second effort on the part of that institution to secure the acceptance of uniform bills of lading. On April 14, 1919, the Commission prescribed a uniform export bill of lading and likewise a uniform domestic bill of lading. Upon petition of interested parties this issue was enjoined by the district court of the United States for the southern district of New York, three judges sitting as the statute provided. The majority opinion of the court held that the Commission had no authority to prescribe bills of lading for either domestic or export traffic. An appeal was taken to the Supreme Court which held that the passage of the transportation act of 1920 made the case a moot one and reversed the order of the district court. The district court was directed to dismiss the petition but without prejudice to the rights of the complainants to assail in the future any order that the Commission might make prescribing bills of lading after the enactment of the new legislation.

TRANSPORTATION ACT MAKES STANDARDIZATION POSSIBLE

The amendment of the Interstate Commerce Act by the Transportation Act of 1920 conferred upon the Commission authority to make rules and regulations prescribing the form of a through bill of lading. Without loss of time the Commission took steps to bring about the contemplated standardization. Railway carriers and shipping interests were directed to confer with the object of drafting a uniform bill of lading and the Commission made arrangements to distribute 500 copies of the tentative bill to export shippers and other interested parties in order that suggestions and objections might be obtained and there be worked out a bill reasonably satisfactory to all the interests involved.

Not without considerable opposition did the Interstate Commerce Commission proceed with its project. A number of the rail carriers, particularly those in the eastern part of the United States, challenged the power of the Commission to do more than prescribe the "form" as distinguished from the substance of the bill of lading. And counsel for American ocean carriers operating in foreign commerce on the Atlantic Ocean made clear their belief that the Interstate body had no power to prescribe any condition applicable to them without their consent. A representative of the Shipping Board who was present at the hearings on the subject conducted by the Commission likewise voiced the belief that the Commission has no jurisdiction over water carriers. The Interstate Commerce Commission has insisted, through it all, that inasmuch as the act to regulate commerce specifically requires carriers to issue bills of lading it has unquestionably power to prescribe as to the issuance, form and substance of bills of lading. Incidentally the Commission called attention to the fact that the rules and regulations constituting the forms of bills of lading affect the value of the service rendered to the shipper or consignee.

Convinced that it was the intent of Congress to require a uniform through export bill of lading and to have the terms prescribed by the Interstate Commerce Commission the latter proceeded with its task and to that end considered forms laid before it by numerous interests such as the prominent carriers, the National Industrial Traffic League, etc. The forms placed in nomination showed wide diversity and sharp variations in the wording of the embodied provisions. In the drafts put forward by shippers there was sought the benefit of full common-carrier liability from the time a shipment is delivered to the initial rail carrier for transportation until it is delivered to the consignee or his order at destination. Carriers, on the other hand, have naturally sought to restrict their liability to what they account reasonable limits.

PROVISIONS OF NEW BILL OF LADING

With this ample fund of suggestions as a working basis the Interstate Commerce Commission evolved the new uni-

Generated on 2024-09-12 11:27 GMT / https://hdl.handle.net/2027/mdp.39015080127403
Public Domain, Google-digitized / http://www.hathitrust.org/access_use#pd-google
Digitized by Google
Original from UNIVERSITY OF MICHIGAN

form bill which provides in effect that the shipment involved is subject to the terms and conditions of the local form bill of lading not inconsistent therewith. Certain physical features of the new bill will presumably meet with general approval inasmuch as there was substantial unanimity of demand for them on the part of both shippers and carriers. For example, there is provision of a bill of lading of a width convenient for use in an ordinary typewriter. Also to be cited is the stipulation of a form which permits all the printed matter to appear on the face of the sheet. This is a minor detail that is important because the number of copies which must be made in a set of export bills of lading is so large that it is desirable to use thin paper. No requirements have been made as to the size of type or color of paper.

Such has been the demand for specimens of the uniform through export bill of lading that the supply of the Interstate Commerce Commission has been exhausted. Copies can be obtained, however, upon payment of 5 cents each by addressing the Superintendent of Documents, Washington, D. C., specifying I. C. C. 7230 (No. 4844). The Contract Terms and Conditions attached to the new standard form make a rather voluminous document, subdivided into three sections. Part I covers the service of transportation until delivery at the port of embarkation. Part II deals with the service after delivery at the port first mentioned and until delivery at the port mentioned second—the port of debarkation. Part III is with respect to service after delivery at the port second mentioned and until delivery at ultimate destination, if destined beyond that port. The form has been prepared with due recognition on the part of the Interstate Commerce Commission of the limitations upon its jurisdiction over the ocean carriers.

This limitation is reflected in the disposition of some of the requests made by shippers. For example, the shippers urged that provision be made specially at a number of places in the bill of lading for notice to the shipper or consignee, or both, of changes which would otherwise be unknown to them, such as change in vessel. Most of the railroad interests are represented as not objecting to giving such notice, but, on this count, the Commission came up against a stone wall in the form of objection by the ocean carriers, exception being taken to the plan on the score of the clerical labor that would be involved in the case of shipments transported in a vessel other than that for which they were originally intended. The new through export bill of lading stops short, in certain other respects, of the desires of shippers at inland points because the Interstate Commerce Commission holds that the Cummins amendment, so called, does not apply to transportation from a point in the United States to a point in a non-adjacent foreign country.

In connection with the order of the Commerce Commission anent the new bill of lading, the Commission has disapproved a number of requests that have been received for permission to use old bills of lading or forms with no conditions printed thereon. The Commission feels that the use of makeshift bills would occasion much confusion in banking circles and among persons not dealing constantly with bills of lading. Moreover with uniform bills of lading in use throughout the country there will be little need for resort to irregular bills.

Pacific Coast Pool Discussed With President and Shipping Board

THE committee representing the various ports on the Pacific Coast, which has been working on a tentative plan for the acquisition of the combination passenger ships owned by the Government and operated in the Pacific, came to Washington on February 8, called on President Harding, and subsequently met with Chairman Lasker and the Shipping Board.

President Harding told the comittee that nothing concerned him more in domestic legislation than providing proper aids to establish an American merchant marine, and that it was one of his earnest hopes to see such aids provided. The President bespoke his deep interest in the formation of a company, the stock of which should be popularly owned by the people of all the Pacific Coast, for the development of the American merchant marine in the Pacific, with the hope of using the united assets of all to develop each port in the interest of the whole.

Chairman Lasker reviewed the needs of the United States on the Pacific Ocean, and pointed out that if ruinous competition prevailed between ports and companies there would not be that opportunity for the development of the American flag in shipping in the East that there would be through a popularly owned company, uniting all the ports of the Pacific Coast, thus cutting down overheads, which might make it possible for some ports to operate ships of certain types, the trade for which otherwise could not be developed.

The Shipping Board made no basis of proposal as to the price at which it held its combination passenger-and-cargo ships, but did stress that, in line with the Jones Act, it was its duty to make sure that the ships passed into private hands at the earliest moment compatible with the Government receiving a proper price. Until the President has delivered his address on government aid to private shipping to Congress, and Congress has taken action on same, the Board did not feel in a position to name a price. Immediately after Congress has expressed its will on merchant marine legislation, the Shipping Board desires to dispose of its Far Eastern passenger ships, feeling that through private operation the trade with the Orient can be much better developed than through Government operation. On behalf of the Board, Mr. Lasker asked the committee to bring about agreements in principle that would iron out the difference between competing ports and make the formation of such a company possible at that time.

Mr. Lasker made it plain that there was nothing in the suggested company that precluded any and all ports and all individuals purchasing any cargo ships desired, on the identical price and terms that any company, including the proposed one, could obtain. Mr. Lasker also pointed out that if a higher bid for the passenger ships other than the bid of the contemplated company was received, the higher bidder would, of course, obtain the ships; but he expressed the fear that unless such a company as contemplated was brought about, there might be no group strong enough to acquire the vessels, and therefore it became the duty of the Shipping Board to attempt to create a customer if none existed. In the creation of such a customer however the Shipping Board could only contemplate one that represented all the people of the Pacific Coast organized in the national interest.

The representatives of the coast ports were unanimous and enthusiastic in subscribing to the Shipping Board's belief that a company such as is proposed was essential for the country, for the Pacific Coast, and to carry out the purposes of the Jones Act. The only reservations were that each port should be free to reach its maximum development, and that the parent company should be so formed as to protect the interest of each port. The committee felt sure that this could be achieved. The committee stressed that while any new company that was formed desired to pay all that the ships were worth, any purchase would have to be based on the ships being acquired at a price that made proper earnings possible, if capital was to be attracted.

Generated on 2024-09-12 11:27 GMT / https://hdl.handle.net/2027/mdp.39015080127403
Public Domain, Google-digitized / http://www.hathitrust.org/access_use#pd-google
Digitized by Google
Original from UNIVERSITY OF MICHIGAN

Developments in Marine Insurance

Standard Open Policy Drafted—Marine Business Picking Up —Oil Storage Hazards—Cleaning Tanks by Rule—Shipowners' Liability in the Courts—Proposed Lloyds' Legislation

By "Bordereaux"

AN important forward step has been taken by the American Institute of Marine Underwriters in endorsing the report of a special committee, recently submitted, on the much-discussed subject of a standard open cargo policy form. This is the reform that the banks have been clamoring for, that the decision of the English High Court of Justice necessitated, if the time-honored insurance certificate were not to lose caste altogether, and which a large number of progressive underwriting offices have been agitating for. To secure it there has been a great deal of hard work done for nearly a year by the special committee of the Institute, and now that it is finally achieved there is a rather disconcerting suspicion that the powerful brokers may bar its general adoption—such, unfortunately, is the influence of "big brokerage" in these United States. The banks will, undoubtedly, welcome it; their association has it under consideration.

This piece of real constructive work sweeps away practically all of the misunderstandings and obscurities connected with the archaic phraseology of the venerable marine policy, so that it will no longer require an expert in occultism to determine just what is covered and how; it clarifies and simplifies the contract and all of its involved clauses, and supplies a standard, uniform, brief but comprehensive document of all the salient terms and conditions. It is, we repeat, a distinct forward step; something that has been needed and that ought to be in general use. But, alas, custom is strong with the older offices, as self-interest is with the brokers, and it may be pigeon-holed after all.

Singapore Losses

A CONTINUOUS run of serious losses on craft in the harbor of Singapore has led underwriters to inaugurate cooperative action through a special committee for purposes of investigation. Unseaworthiness and over-loading are generally given as the chief causes of these reverses. It is now suggested that a surveyor be appointed to supervise craft at Singapore, the expenses to be met by the interests concerned. American underwriters are less involved than British.

Marine Writings Are Picking Up

WHILE it is admittedly under pre-war volume there are decided indications that the marine insurance business is on the gain. This is accounted for by the encouraging increase in export trade, which last year was but slightly under the normal; the heavy overstocks of American manufactured goods accumulated by foreign buyers during the frenzied purchases of 1919 and 1920 are being worked off, and normal requirements are being filled in a sane and healthy manner. Refined sugar is moving in large quantity to Europe, and food and other supplies for Russian relief are going forward steadily through both Baltic and Black Sea ports. Gold bullion, in considerable amount, is moving from Swedish ports to the United States—probably Russian gold sent by the Soviet government, or by private interests of that country, for the purchase of supplies to supplement the shipments of the United States. A glance at the manifests will show that imports from Europe are steadily improving in volume. The outstanding unfortunate feature of the times, from the viewpoint of the underwriter, is the very low rates quoted by both British and Continental offices. Their motto appears to be, "Get the Business."

Peril in Oil Stowage

UNDERWRITERS have been greatly interested in the recent decision of a British court awarding heavy damages to an American company, owner of the cargo of oil lost when the *Clan Gordon* capsized off Hatteras in 1919. There was a deep cloud of mystery surrounding this disaster, for the vessel left New York in apparently seaworthy condition and turned over in calm weather. By the finding of the Court the steamship company was at fault in failing to instruct the captain to provide water ballast, thus permitting the vessel to sail in unseaworthy condition.

The important point to this case is that care has to be exercised in the proper stowing of a cargo. The average layman is of opinion that the only requisite in loading a ship is to get all the cargo possible on her. The truth is that both the loading and discharge must be scientifically managed, for not alone is it possible by poor loading to impair the stability of the vessel, but by improper discharge the ship may be so strained as to do serious injury to the hull.

Rules for Cleaning Oil Tanks

VALUABLE constructive work has been done by the Marine Fire Hazards Committee of the National Fire Protection Association, and its findings, resultant from more than a year of conscientious work, have been embodied in a report just submitted by a sub-committee. These findings suggest practical ways of combating the fire hazard to vessels, and are based upon the best judgment of recognized experts from the United States Bureau of Mines, the United States Army and Navy, the Shipping Board, and of leading oil companies and dry dock establishments.

The sub-committee's report, while not applying to urgent emergency repairs, gives careful consideration to proposed regulations for the freeing of oil tanks, bunkers and compartments of flammable and explosive vapors previous to entering for any purpose or making repairs. It is proposed to impose a prohibition against making repairs of any kind to any tank, compartment, bunker or other container or space previously containing explosive and flammable liquids, until the requirements hereinafter outlined have been complied with.

The process of freeing such containers of vapor shall be as follows:

1. (a) Tanks shall be closed and live steam blown into the tanks or space to be cleaned and all pipes leading thereto or therefrom for a period of time to be governed by the conditions and the nature of the oil carried. Vent pipes shall be proved and left open. Inasmuch as the time for

Generated on 2024-09-12 11:21 GMT / https://hdl.handle.net/2027/mdp.39015080127403
Public Domain, Google-digitized / http://www.hathitrust.org/access_use#pd-google
Digitized by Google
Original from UNIVERSITY OF MICHIGAN

steaming will be determined by the foregoing no definite rule is laid down to cover all contingencies, but a carefully worked-out table accompanies the report, and is recommended for use as covering average general conditions. By this table the time of steaming is arrived at by taking the number of hours given in the table, under the actual size of steam connection corresponding to the value given for the volume in cubic feet of the compartment to be steamed. These calculations are based on a steam pressure of 100 pounds per square inch. In steaming tanks the last one-fifth of the steaming period should be carried out with manhole plates or tank lids open to the atmosphere.

Upon completion of this operation the tank or space must be ventilataed thoroughly by means of wind sails, forced or induced draft. Thereafter, specimens of air shall be taken from the tank by a competent chemist, vouched for by the American Bureau of Shipping, and shall be analyzed or tested by him; and should the presence of explosive or inflammable gases still be detected the steaming and ventilating process shall be resumed and continued, after subsequent tests, until the air is pronounced pure.

There are also rules for cleaning tanks for shipyard repairs; also with respect of ventilation, use of tools and lights and gas masks, and the precise kind of permit the foreman must have over the signature of the superintendent.

The National Fire Protection Association is to pass upon these suggestions at its annual meeting next summer. It is more than probable that they will be adopted substantially as they stand.

Loss on the Northern Pacific

LONDON underwriters sustained a loss of $1,200,000 when the Admiral liner *Northern Pacific* was burned and sunk off Cape May on February 9. It is generally reported in the New York market that the rate was ⅜ percent for the trip to Chester, Pa., and for builders' risk while repairs were effected at the yards there. The insurance was captured by London at a rate under what our underwriters were willing to accept, and the heavy penalty falls entirely on the British insurer, less such reinsurance as may have been secured.

The fact that this vessel was one of the fleetest and finest under the American flag, equipped with the most approved safeguards to safety, renders the cause of her destruction peculiarly interesting to underwriters everywhere. If it turns out to have been the dreaded "flare back"—a peril too closely associated with previous losses of oil-burners—there will probably be promptly inaugurated investigations looking to the introduction of safeguards for the reduction of this hazard.

Oil Tank Overflows

AT the risk of appearing to give undue space to oil perils we venture to call attention to the singular problems arising out of the overflowing of the fuel oil tank of the *Cardiganshire* when she was taking on her oil supply at Colon recently. She was bound from Seattle to the United Kingdom. The tank was allowed to overflow in the operation, and considerable damage was done to cargo in the 'tween decks. Who is going to be held responsible? The courts will doubtless be called upon to decide, but, in the meanwhile, there is much speculation on the subject.

Filling fuel tanks is certainly connected with the management of a vessel, and yet the courts will undoubtedly again construe the Harter Act in a way to relieve the carrier of liability, although the consequences of the negligence of one man's servant will thus have to be borne by an innocent party. The underwriter can scarcely be held responsible, for a careful survey of the usual form of the "perils clause" will fail to disclose any mentioned hazard which seems broad enough to include oil damage; certainly not negligence in the filling of oil tanks. It would therefore appear that the unfortunate cargo owner is to be without redress; and that is a hard thing, because he, of all others, was innocent of the cause of the damage, and yet he may be obliged to sit by and see those who were responsible pass scathless through the meshes of the law.

Proposed Lloyds' Legislation

IN view of the long-continued and often acrimonious discussions anent the placing of insurance on American risks with Lloyds, London, and other unauthorized insurers, it is important to note that, as a result of numerous recent conferences between the conflicting interests and the New York insurance superintendent, a tentative form of a marine insurance bill has been drafted that is acceptable to both brokers and representatives of admitted foreign companies. When finally corrected and agreed to by the marine conferees the bill is to be given full publicity and all interests in any way concerned are to be invited to have a part in criticizing and improving it. The Insurance Department takes no position in the matter, either for or against, and only desires to have all interests advised of what is under way and to have a part in the proposed legislation.

Shipowners' Liability in the Courts

UNDERWRITERS have been much interested in the decision recently handed down by United States Judge Jeremiah Neterer, of the Western District of Washington; and for better reasons than that it represented a reversal by his Honor of himself, as of court record of but two months previous. It had under consideration the celebrated case of the steamer *Princess Sophia,* wrecked October 25, 1918, and it grew out of the defense of the ship's owner, the Canadian Pacific Railway Company, against damage suits brought by two hundred claimants because of the loss of three hundred and forty-three lives and much valuable baggage and cargo. The defendant was allowed by the court to plead limitation of liability for loss of life, baggage and cargo. The vessel herself being practically worthless, the claimants will find themselves limited to approximately $8,000 aggregate damages. The captain of the vessel had refused aid when offered by other steamers standing by; but this action, the railway company insisted, it had no hand in. On the question as to whether insurance might be regarded as an interest in the vessel Judge Neterer decided that it could not, citing in support of his position the decision of the Supreme Court in the case of the *City of Norwich,* to wit: "We are not only satisfied that the law does not compel the shipowner to surrender his insurance in order to have the benefit of limited liability, but that a contrary result would defeat the principal object of the law."

LAUNCH OF STEAMSHIP MATIANA.—The steamship *Matiana,* built for the British India Steam Navigation Company by Messrs. Barclay, Curle & Company, Ltd., was launched on January 26 from the firm's West Yard, Scotstoun. The vessel is of the intermediate cargo and passenger type, 485 feet by 58 feet 3 inches by 36 feet, with a gross tonnage of 8,970, and will be propelled by twin screws driven by Parsons double reduction geared turbines, capable of developing a sea speed of 14 knots. The boilers and bunkers are so arranged that the vessel can work either on coal or on oil fuel. Accommodation is provided for 105 first class and 41 second class passengers, the Inchcape system of inner room being adopted so as to give the maximum lighting to living spaces.

Generated on 2024-09-12 11:21 GMT / https://hdl.handle.net/2027/mdp.39015080127403
Public Domain, Google-digitized / http://www.hathitrust.org/access_use#pd-google
Digitized by Google
Original from UNIVERSITY OF MICHIGAN

Shipping and Shipbuilding In Great Britain

Capital Plentiful for Shipping—High Costs and the Shipping Depression—Shipbuilding Prospects Gloomy But Not Entirely Hopeless

By W. H. Wendon

THE most remarkable feature of the British shipping industry at the present time is the rapidity with which new issues of capital are being subscribed by the public. Three very well-known companies—the Union-Castle Line, the Clan Line and the African Steamship Company—invited the substantial amounts of £2,000,000, £1,500,000 and £1,500,000 respectively. Despite the depressed condition of the freight market and the poor position of trade generally, the new capital was acquired with consummate ease. It is no exaggeration to say that, had the total sum invited by these three companies been ten times what it was, it would still have been forthcoming. As I have hinted, the reasons for this rush to invest in shipping securities are rather obscure, and the fear is already being expressed in responsible shipping circles that, emboldened by this glut of money for liner company issues, tramp concerns of the mushroom type will take advantage of the situation and float wild-cat companies similar to many which were born during the war and post-war boom. Many companies have steamers standing in their books at far above their present values, and investors are being urged to view the solicitations of the managers of these concerns with something amounting to suspicion.

Seamen Accept Cut in Wages

The most significantly optimistic note which the shipping trade enjoys at the moment is in regard to wages. Sailors, firemen and stewards in foreign-going vessels have agreed to a reduction of £2 a month, the cut in the wages of coasting employees being ten shillings a week. This is in contrast with the shipowners' original proposal of a reduction of £3 a month and fourteen shillings a week respectively. Both parties appear to be well satisfied with the settlement. Higher ranks will receive proportionate reductions. A feature of the new scale is that thirty shillings of the £2 will be knocked off on March 1, and the remaining ten shillings two months later. In the words of the official statement: "The settlements are conditional on there being no general and very appreciable improvement in the chartering rates of steamers between January 1, 1922, and the dates on which the reductions fall due."

The position of British shipowners *vis à vis* their Continental competitors is arousing a good deal of interest, and no small comment. The matter has been brought to a head by the President of the Chamber of Shipping of the United Kingdom (Sir Owen Philipps) and deputy chairman (Sir Frederick Lewis) receiving an influential deputation of iron and steel manufacturers on the subject of freight rates on metals. Iron and steel industrialists declare that all costs of production have been reduced very considerably, and at the conference referred to, it was maintained on their behalf that a point had been reached where it was found that the question of freight was the deciding factor whether business should be placed in this country or on the Continent.

Freight Rates on Metals

Sir Owen Philipps, in his reply, pointed to the heavy fall in freights, which he described as being in some cases little more than barely living rates. Fifteen to twenty percent of the whole tonnage of the British Empire is now laid up, and over 1,000 modern steel steamers owned by the United States Shipping Board are out of commission on account of freights being so abnormally low, and, moreover, many British vessels at present engaged in trading are not doing so at a profit. Bearing these salient facts in mind, Sir Owen Philipps said it was desirable to consider whether the f.o.b. prices at which British manufacturers offer their commodities for sale compare reasonably with f.o.b. prices of their foreign competitors. He instanced the fact that, in the case of one recently placed great steel contract, the difference in prices tendered was so enormous that, even if the British shipowner had been satisfied to carry the material for nothing, the British manufacturers' prices would not have been accepted. There was no question of advantage or otherwise in regard to freight charges, as, in the South African trade, the rates of British ships from the United Kingdom and the Continent were identical. Moreover, the British lines, in order to assist the British manufacturers, offered to carry the cargo at whatever rates were taken by foreign lines.

In concluding his spirited reply, Sir Owen Philipps maintained that there was no denying the fact that Continental countries had in some cases got ahead of us. There were many factors which had contributed to this result, such as longer working hours and cheaper labor, the exchange and generally lower cost of production. He believed that British trade, commerce and shipping were faced with very difficult times for the next few years, and the closer they worked together the better.

Economical Ship Operation Vital

High costs and the shipping depression generally were the subject of some interesting remarks by Mr. A. D. Mearns, director and general manager of the Cunard Line at Liverpool. Analyzing the situation, he pointed out that at a recent date there were over fifty million tons of shipping looking for employment—a figure so vast that it was difficult to comprehend. A large amount of this tonnage is tied up in the ports of the world, but, notwithstanding this, Lloyd's Register's latest returns show that at the beginning of the current year there were over 1,000 vessels under construction, with a gross tonnage of nearly 4,500,000. This tonnage, said Mr. Mearns, must be absorbed before they could look for profitable trade, but it was clear that for a long time there would be a floating element of tonnage which would have a detrimental effect upon the profitable operation of the remainder.

The question resolves itself into one of costs, and the ship which can be operated most economically and provide an efficient service is the one that will get the business. The proposition is a simple but vitally important one. With the price of construction three or four times above the pre-war figure, it is obvious that new tonnage is under an immediate disability with its competitors. The sequel is to be found in the idle shipyards of the country, where contracts have been cancelled and thousands of tons of shipping is suspended.

Sir Walter Runciman, who created a certain amount of sensation by repurchasing eight of the steamers which he sold at the top of the boom to the unfortunate Western Counties Shipping Company—taking them back, of course, at a fraction of the sum which he received for them—has just had delivered to him the initial steamer of six which are to run

Generated on 2024-09-12 11:24 GMT / https://hdl.handle.net/2027/mdp.39015080127403
Public Domain, Google-digitized / http://www.hathitrust.org/access_use#pd-google
Digitized by Google
Original from UNIVERSITY OF MICHIGAN

in conjunction with the re-purchased eight. Messrs. William Doxford & Sons, of Sunderland, are to build these six boats, and the last is to be delivered by June. As to the depression, Sir Walter Runciman is too wise to attempt to predict the length of it, but in his judgment we have a long way to go before we reach rock bottom. He does not think it will be this year, or even next year. He ascribes the reason for his and his colleagues' re-entry into shipowning as being due to the fact that they prefer to manage their own money than leave it in the hands of the Government "to waste."

Shipbuilding on the Clyde Slack

Clyde shipbuilders, in common with those in other great construction centers, continue to look to the future with anxiety. In this connection it is noteworthy that in some quarters—notably in the lay press—false deductions are being drawn from the fact that in January the Clyde placed into the water the record total of 56,414 tons gross, representing nine vessels. Prior to this the highest tonnage launched on the river was 39,910 tons in January, 1920. The reason for the figure climbing to 56,414 tons is, of course, that it included such large vessels as the P. and O. liner *Bendigo*, of 13,100 tons, and the *Athenia*, of 12,000 tons.

Far from there being a "boom," as is suggested by the uninitiated, the launching of these and other vessels simply means that so many additional berths are rendered vacant. The most important new contract—indeed, almost the only one worth recording this month—is the twin-screw steamer to be built by Scott's Shipbuilding and Engineering Company, of Greenock, for Messrs. Alfred Holt and Company's Blue Funnel Line. Her dimensions will be 400 feet, by 52 feet, by 32 feet, and her most interesting feature is that she will be propelled by Scott-Still engines, which represent the latest development in marine propulsion, and embody a new principle consisting of a combination of an oil engine and steam engine. The boat's twin-screw machinery will develop 2,500 brake horsepower and particular significance is attached to this decision to install an entirely new class of machinery.

Holt Liner To Have Still Engines

Details of the "Still" system are not devoid of interest. It appears that rather more than a year ago Scotts' Shipbuilding and Engineering Company acquired a license for the manufacture of the Still engine, and built an experimental set, upon which prolonged trials were carried out. The results are said to have definitely proved that the "Still" engine has a lower consumption than any other type of prime mover now being manufactured commercially. In the new vessel for the Holt Line, two of these motors, each of 1,250 horsepower, will be fitted. It is claimed that a thermal efficiency is reached some 15 or 20 percent in excess of that of the ordinary four-cycle Diesel engine. Although this will be the first ship equipped with "Still" engines, a great amount of experimental work has been carried out in the past ten years.

New Liner for Glasgow-Canadian Service

The passenger and cargo steamer *Athenia*, to whose launching I have already referred, is to engage in the Anchor-Donaldson Line's Glasgow Canadian service. She has been constructed by the Fairfield Shipbuilding and Engineering Company, of Glasgow, is of the shelter deck type, with straight stem and cruiser stern, and has two steel masts. Her principal dimensions are 520 feet, by 66 feet, by 42 feet, her gross tonnage is 12,000, and her loaded draft 27 feet 8 inches. The propelling machinery consists of two sets of Brown-Curtis double reduction geared turbines. Steam is supplied by three double-ended and two single-ended boilers, arranged to burn oil, and with a working pressure of 210 pounds per square inch. Accommodation is provided on the bridge deck amidships for 354 cabin passengers in staterooms arranged for one, two and four berths. On the shelter deck, which extends almost the full length of the ship, accommodation is provided amidship for 162 cabin passengers. The third-class passenger accommodation is situated on the upper deck and main deck, the cabins being fitted for two and four passengers in each room.

Shipping and Shipbuilding Prospects Not Hopeless

On the occasion of the launching of the *Athenia*, Sir Alexander Kennedy, managing director of the Fairfield Shipbuilding Company, referred at some length to the shipping and shipbuilding depression. He maintained that, while the immediate prospects are not bright, the position is not entirely hopeless. In pointing to the seriousness of the depression, he recalled that in 1908—the worst pre-war year within recent times—the total tonnage commenced was 787,500; in 1909 it was 1,165,000 tons; in 1910 1,349,000 tons; in 1911 1,904,000 tons; in 1912 2,099,000 tons; and in 1913 1,855,000 tons. Passing to the war period, we find that, in the artificial boom of 1919, there were commenced vessels representing 2,391,000 tons, and in the continuation of that boom throughout 1920 there were 2,351,500 tons. But in 1921 the total was only 518,300 tons. The slump last year came with startling suddenness, and of vessels commenced the total was practically one-third less than that of the previous worst year. Turning to costs and values, Sir Alexander Kennedy declared that there would have to be a full realization of the actual facts, and a determined effort on the part of everyone to bring values and costs into closer relationship.

Labor Troubles

At the time of mailing this review, the labor outlook in the engineering industry in Great Britain is a dubious one. Negotiations are in progress between the masters and the men, but the results are so far unsatisfactory. The position is as follows: During the war and since, it has been the common practice for the unions in the engineering shops to say exactly what overtime should be worked. Not unnaturally, the employers wish to alter this. As the result of a conference between the Engineering and the National Employers' Federation and the representatives of the workers, proposals were put forward which in effect gave each employing firm the right to dictate the circumstances in which overtime should be worked. These proposals, endorsed by the executive of the Amalgamated Engineering Union, went to a ballot of the men. In the result, 35,525 voted in favor of the proposals and 50,240 against, or a majority of 14,715 against accepting the terms. The position at the moment is that the decision has been officially reported by the union to the employers, who are considering what next step can be taken.

Scandinavian Shipping

THE statistics recently issued by the Norske Veritas show that the Norwegian merchant fleet at the beginning of this year comprised a total of 2,500,000 tons, or an increase of 200,000 tons as compared with last year.

The Swedish mercantile marine with a total of 1,090,000 tons shows a net decrease of 10,000 tons.

The Danish mercantile marine has increased during the last year by 85,000 tons, making a total at the commencement of the present year of 870,000 tons.

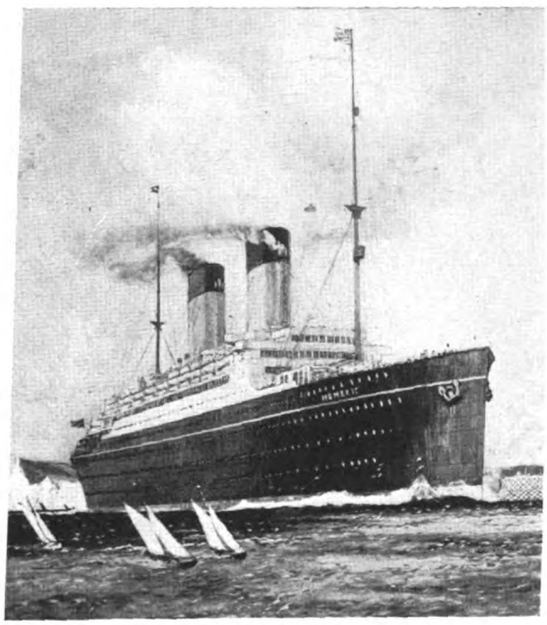
At the end of 1921 there were under construction in Sweden 38 ships of 86,640 tons, in Denmark 38 ships of 82,233 tons, and in Norway 53 ships of 77,330 tons. However in all three countries work has been suspended on a large number of vessels.

Generated on 2024-09-12 11:21 GMT / https://hdl.handle.net/2027/mdp.39015080127403
Public Domain, Google-digitized / http://www.hathitrust.org/access_use#pd-google
Digitized by Google
Original from UNIVERSITY OF MICHIGAN

The New White Star Liner Homeric

Magnificent Express Steamer for High Class Transatlantic Travel Arrives in New York on Maiden Voyage

THE *Homeric* of the White Star Line should be of particular interest to the marine field because she is the type of steamship that is most needed today. Her success as a business venture is practically assured. Whatever may be the losses suffered in the carriage of freight, due to the world surplus of cargo ships, it will be some time before there are enough passenger ships to take all of the ever-increasing traveling public. Passenger fares are higher than they ever were and the *Homeric*, due to her superior accommodations, will be able to command the maximum rates.



(From a painting by Charles Dixon)

White Star Liner Homeric

Designed with a definite view of providing the greatest possible degree of personal comfort to each and every passenger, yet ranking as one of the greatest transatlantic liners, the *Homeric* is a ship of distinctive character. The facilities of a private yacht exist in her for rendering intimate, personal service to the individual, the family, or the tourist party. In her bedrooms the old-time upper berth has been eliminated, and with it generations of tradition; in her dining rooms small private tables, in varying sizes, predominate.

Principal Characteristics

Length	777 feet 0 inches
Beam	83 feet 0 inches
Depth, bridge deck to keel	100 feet 0 inches
Horsepower, reciprocating engines	28,000
Speed, normal	20 knots
Gross tonnage	33,526
Displacement, tons	42,000
First class passengers	491
Second class passengers	422
Third class passengers	1,740
Crew	750

Upon the completion of the *Majestic*, the world's largest ship, the White Star Line will have three vessels on the weekly service between New York, Cherbourg and Southampton, having a total tonnage of (*Majestic*, 56,000; *Olympic*, 46,439; *Homeric*, 33,526) 135,965 gross tons.

Interior Arrangement

A distinctive feature of the *Homeric* is the size of her public rooms which in some cases are larger than similar rooms on the *Olympic*. The lounge, for example, is considerably larger than the lounge on the *Olympic*. The arrangement of the public rooms, which are on the upper deck, is in the form of an imperial suite, each room being distinguished by an impressive and marked character.

At the forward end of the deck, under the navigating bridge, is a drawing room, with large plate glass observation windows. Next comes a reading and writing room, and next the lounge. Beyond this is a music room, and still further on the smoking room with a glass enclosed sun veranda completing the group. The view down the full length of the rooms, at the sides, from drawing room to sun veranda, presents an unbroken vista of 340 feet.

The Lounge

The architectural design and adornment of the lounge on the *Homeric* reminds one of the interior of a Roman mansion. Its length is 94 feet, its width 47 feet, and its ceiling is 20 feet high, with a great central dome of amber glass through which the light comes as through champagne.

On either side of the room is a colonnade of fluted Doric pillars, with bases and capitals richly gilt—a commanding decorative feature, with tall windows between, from which the light falls through harmonious draperies.

The color tone of this sumptuous room, ivory and gold, is relieved by blue. The ceiling has deeply carved panels in gilt against a ground of old blue. A carpet of wonderfully deep pile has large circular designs of blue and old rose on a ground of gold. The central part of this carpet is removable, uncovering a ballroom floor inlaid in a design of stars, in two kinds of walnut. This space has a capacity for 300 dancers. When the dancing space is not in use the entire lounge is arranged with tasteful groups of beautiful furniture, each of a distinctive style of period, and noteworthy for its rich and varied upholstery.

At either end of the room are large canvases, one portraying Columbus landing on the soil of the New World, the other his reception by Ferdinand and Isabella. Smaller panels, at the corners of the room, represent in classic figures the elements—earth, air, fire and water.

Library and Dining Room

The reading and writing room is just forward of the lounge. Book cabinets are installed along the forward wall. Double writing desks of mahogany with ebony ornaments are placed along the sides in recesses lighted by casement windows. The arm chairs for the desks, which revolve on ball bearings, have their bases fixed.

A green marble fireplace, having winged seats, is fitted on one side of this room. In the center of the room is a great round reading table located under a skylight. The color tone of this room is ivory and olive green with a touch of old rose in the carpet and hangings.

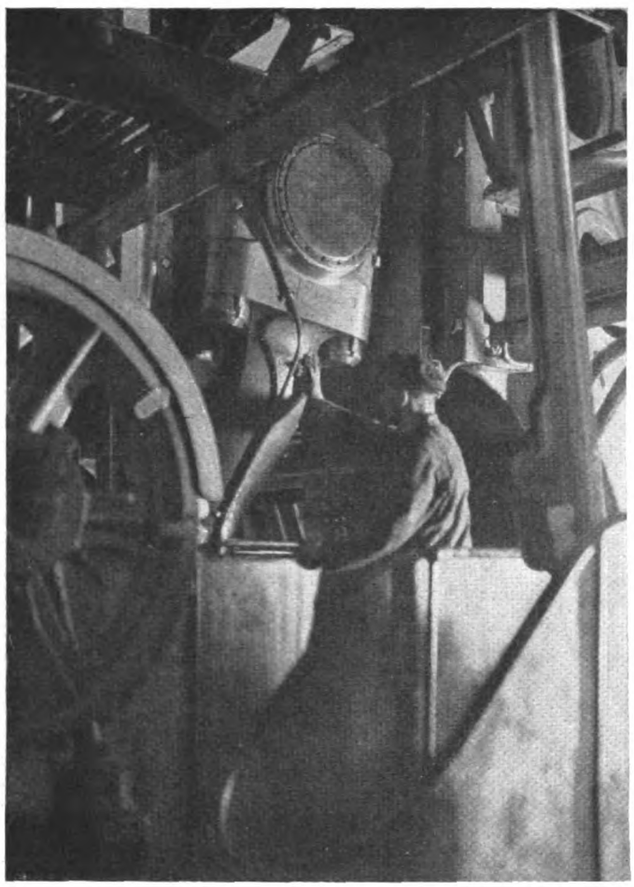
Next forward of the library is the drawing room, reached through two square arched openings. This is a charming observation post, giving a wide view ahead, through broad plate glass windows. Everything here is light and airy, like a summer garden. The furniture is chiefly in white enamel —graceful chairs and settees, cushioned in green velour; circular garden sets in lattice, for palms and ferns, and small round tables, with choice marble tops. The hangings are in delicate solid colors.

Generated on 2024-09-12 11:47 GMT / https://hdl.handle.net/2027/mdp.39015080127403
Public Domain, Google-digitized / http://www.hathitrust.org/access_use#pd-google
Digitized by Google
Original from UNIVERSITY OF MICHIGAN

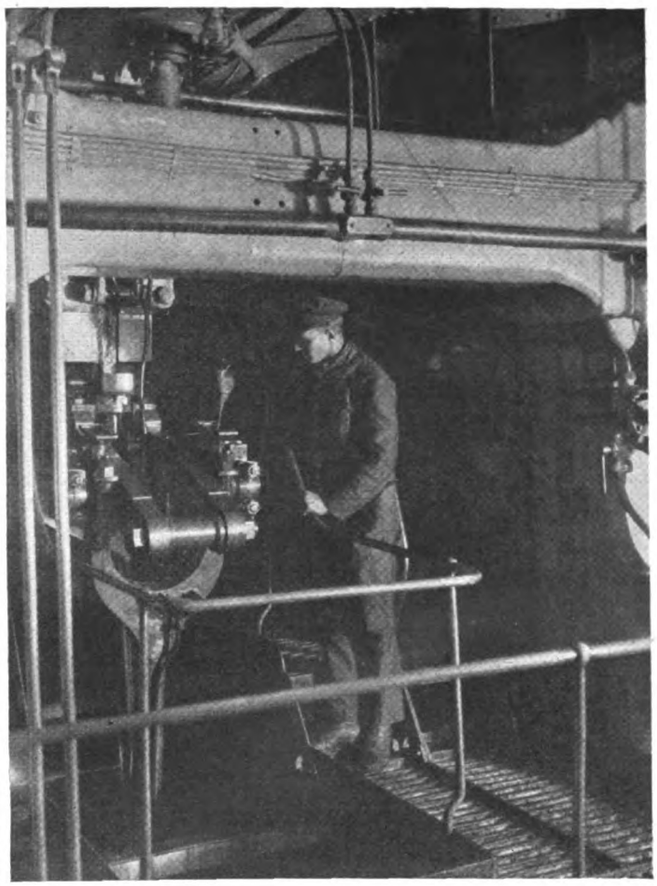
THE MUSIC ROOM

The special feature of the music room is the light touch with which the joyous character of music is expressed in its decorations. The carpet is very delicately colored with great nosegays of pink rosebuds on a ground of soft gray while the border is a pale blue.

On the walls are two large paintings, done in the manner of tapestries, with scenes from Mozart's opera "The Magic Flute"; on one hand is the sleeping princess approached by the Moor; on the other, the elfin bird catcher making magic music to his fantastic little lady love. This room has a mantel in delicate marble with bronze ornaments and mirrored panels surmounted by symbolic ebony carvings on a gold ground.



Crosshead End of Connecting Rod



Showing Link of Valve Gear

THE SMOKING ROOM

The smoking room is a lofty rectangular apartment, 38 by 50 feet, its high walls wainscoted to the top in small panels of dull-finished walnut, and with a ceiling of carved wood, done in flat white, the room conveys at first glance a message of dignity and repose.

The greater dimension is across the ship, terminating on either side in bow windows 18 feet high, hung in silk curtains of buff and olive, in perfect harmony with the ripe tone of the walls and the opulence of the massive overstuffed pieces, some in colored wool tapestries, others in deep green morocco, with which the room is furnished. Beside each window is a tall-backed winged chair in red morocco, and on either side of a marble fireplace is a great tapestry armchair, promising the ultimate in comfort. In suitable positions are small, marble-topped tables.

Let into the upper walls are four large panels done in oils in the Dutch manner, still life studies of fruits, flowers and game, flanked by carvings symbolic of sports, while over the mantel is a large painting of a young woman mounted for the hunt.

Beyond the smoking room, and reached from it by an arched exit, up three broad steps, is a glass enclosed sun veranda, from which a clear view astern may be obtained.

THE FIRST CLASS DINING SALOON

The dining saloon, which is situated on *D* deck amidships, has a seating capacity for 500 persons. A great inverted dome of crystal pendants, which reflects the brilliancy of hundreds of concealed electric bulbs, centered in a ceiling of white and gold, is fitted over the lofty central portion.

There are galleries on both sides from which an impressive view of the room below may be had. The color tone of the dining room is jade green, ivory and gold. The tables are mahogany, the arm chairs mahogany frame with seats and back cushions of morocco.

STATEROOMS AND BATHS

On this ship the staterooms might be more properly called bed rooms. The oldtime upper berth has given place to twin metal beds with box springs and hair mattresses. The smaller rooms have single metal beds either of the conventional or berth bed type. Many of the rooms have a shower bath and toilet attached and a large number have fixed wash basins with running hot and cold water. The suites are fitted with private bath rooms and there are also an unusual number of public bath rooms.

SPECIAL FEATURES

The following are among the special features with which this ship is equipped: A complete telephone system supple-

Generated on 2024-09-12 11:20 GMT / https://hdl.handle.net/2027/mdp.39015080127403
Public Domain, Google-digitized / http://www.hathitrust.org/access_use#pd-google
Digitized by Google
Original from UNIVERSITY OF MICHIGAN

Striking Interior Views on White Star Liner Homeric

(1) First Class Dining Saloon; (2) Lounge, Showing Colonnade of Doric Pillars; (3) Music Room; (4) Electric Bake Oven.

Generated on 2024-09-12 11:25 GMT / https://hdl.handle.net/2027/mdp.39015080127403
Public Domain, Google-digitized / http://www.hathitrust.org/access_use#pd-google
Digitized by Google
Original from UNIVERSITY OF MICHIGAN

ments the usual installation of electric bells for service calls; two electric elevators are situated in the first class quarters and one in the second class; a gymnasium for both men and women; an electric ray bath; hair dressing parlors; a dark room for amateur photographers and a typewriting room.

The *Homeric* was built at the Schichau yard in Danzig, Germany, and was just about ready for service when the war broke out in 1914. She remained in Danzig until 1919, when she was taken to Hamburg, where the interior work necessary for her service in the White Star fleet was finished.

Oil Tanker Fort McHenry Launched

THE tanker *Fort McHenry* was launched at the Baltimore Dry Docks lower plant, Locust Point, Baltimore, Md., of the Bethlehem Shipbuilding Corporation, Ltd., on February 1. Mrs. John Philip Hill, wife of Congressman Hill, of Maryland, sponsored the vessel.

The vessel is classed at American Bureau of Shipping rating A-1-E and at Lloyd's rating 100-A-1, both with the notation "carrying petroleum in bulk." The construction and equipment are in accordance with the latest rules of the United States Supervising Inspectors of Steam Vessels.

Tanker Fort McHenry Just After Launching

The principal particulars of the *Fort McHenry* are:

Length, overall, 354 feet 6 inches.
Length, between perpendiculars, 340 feet 0 inches.
Beam, molded, 49 feet 0 inches.
Depth, molded, 28 feet 7 inches.
Load draft, 23 feet 6½ inches.
Deadweight tonnage, 6,050.
Speed, 10 knots.
Type of engine, triple expansion.
Size of engine, 23 inches by 39 inches by 65 inches by 42 inches stroke.
Indicated horsepower, 2,000.
Number of boilers, 2.
Type of boilers, single end, Scotch.
Size of boilers, 15 feet 6 inches by 11 feet 5¾ inches.
Kind of fuel, oil.

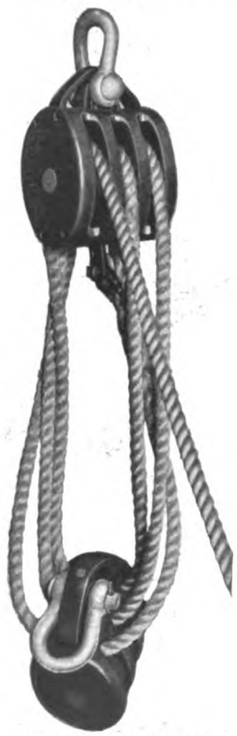
The vessel is built on the Isherwood system of longitudinal framing, with a straight stem and semi-elliptical stern. The machinery is aft. The cargo space consists of 14 main cargo oil tanks and 8 summer oil tanks separated by oil-tight transverse and longitudinal bulkheads. A deep tank is fitted between the pump room and fore peak for fuel oil, with the hold and 'tween decks above the tank available for dry cargo.

The *Fort McHenry* will be completed, ready for service, about April 1.

Non-Toppling Block for Boat Falls

IN compliance with a recent ruling of the United States Steamboat Inspection Service that "when more than one lifeboat is served under one set of davits means shall be provided that will prevent the davit tackle from twisting or capsizing and that will permit the tackles being readily rounded up for the purpose of launching the remaining lifeboat under such davits," the Steward Davit and Equipment Corporation, New York, has developed a non-toppling and non-twisting block to be used for lifeboat falls.

The principle evolved to prevent these blocks from capsizing or toppling lies in definitely confining the path of each rope in the upper part of the lower block and also by providing a very wide mortise, easy running sheaves and by keeping the center of gravity of the block low down. The sheaves are mounted on large bearing pins and, although they are bronze bushed, provision is also made for lubrication.



The Conventional Blocks

The Steward Blocks

By flaring the upper portion of the side plates of the lower block, it has been possible to utilize the rivets and spacing pieces as runners to insure a line entering and leaving the block without binding or toppling. Just sufficient clearance is provided for an easy run out of the block on the opposite side. A heavy well-proportioned swivel link is supplied in the bottom of the lower block for attachment directly to the release gear in the lifeboat.

On the side of the lower block, the non-twisting arrangement is fitted. This consists of a flat bar attached to the block to which is shackled a length of light wire rope connected to a similar pendant attached to the opposite block at the other end of the boat. This arrangement prevents twisting of the blocks and has been recommended by the British Board of Trade as well as having been accepted by the United States Steamboat Inspection Service.

Generated on 2024-09-12 11:23 GMT / https://hdl.handle.net/2027/mdp.39015080127403
Public Domain, Google-digitized / http://www.hathitrust.org/access_use#pd-google
Digitized by Google
Original from UNIVERSITY OF MICHIGAN

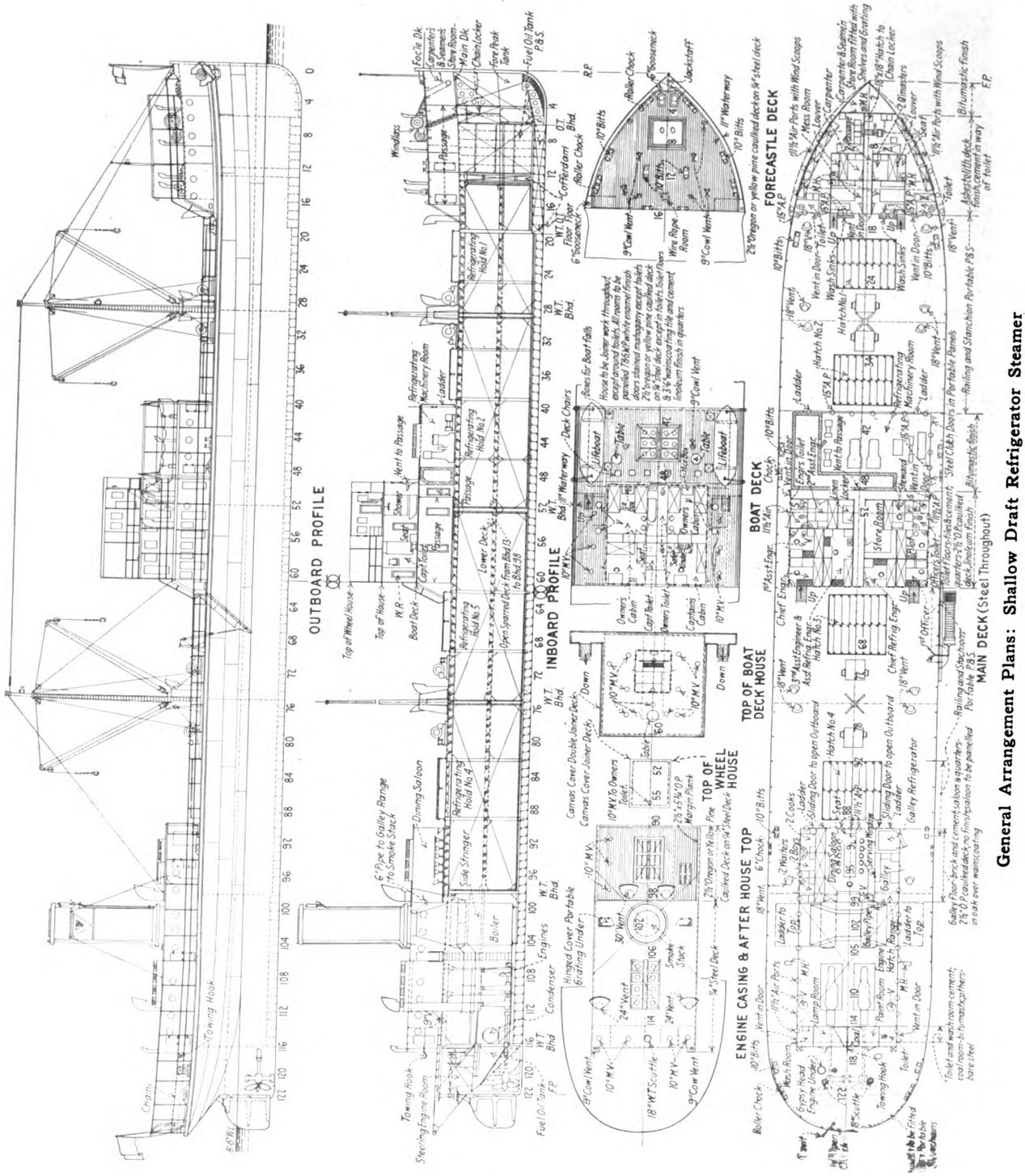
Shallow Draft Refrigerator Steamers

Vessels Built for Service on South American Rivers—The First American-Built Steamships to Fly the Paraguayan Flag

TWO twin screw shallow draft refrigerator steamers have recently been built at the Moore plant of the Bethlehem Shipbuilding Corporation at Elizabethport, N. J., for the International Products Steamship Company, of New York. These vessels are of the single deck type with a raised forecastle and are designed for service on the rivers Parana and Paraguay in South America.

Cargo Equipment

Cargo is carried in four holds which are insulated



General Arrangement Plans: Shallow Draft Refrigerator Steamer

Generated on 2024-09-12 11:26 GMT / https://hdl.handle.net/2027/mdp.39015080127403
Public Domain, Google-digitized / http://www.hathitrust.org/access_use#pd-google
Digitized by Google
Original from UNIVERSITY OF MICHIGAN

Shallow Draft Refrigerator Steamers

General Information

Service: Transportation of frozen or chilled meats from Asuncion, Paraguay, to Buenos Aires, Argentina.

Builder: Moore Plant (Elizabethport, N. J.), of the Bethlehem Shipbuilding Corporation, Ltd.

Owner: International Products Steamship Company, New York.

Characteristics

Length, overall	254′ 0″
Length, B. P.	245′ 0″
Breadth, molded	40′ 0″
Depth, molded	18′ 7″
Draft, loaded	8′ 6″
Draft, light	
Block coefficient	0.804
Midship section coefficient	0.98
Longitudinal coefficient	0.82
Speed, loaded, miles per hour	12
Cruising radius, nautical miles	
Framing	Transverse
Class, Lloyds 100 A-1	

Tonnages

(In tons of 2,240 pounds)

*Weight of Hull	878
**Weight Propelling Machinery	122
Deadweight Capacity	948
Displacement	1,948

(In tons of 100 cubic feet)

Gross register	1,625
Net register	962

*Weight of Hull includes Hull Proper, Hull Fittings, Equipment, and Outfit.

**Weight of Propelling Machinery includes Engines, Boilers (Wet), Shafting, Propellers, and Machinery Space Auxiliaries.

Canal Ratings

(In tons of 100 cubic feet)

	Gross	Net
Suez		
Panama		

Equipment

(1) Bower anchor, stockless	2,856 lbs.
(1) Bower anchor, stockless	2,352 lbs.
(1) Stream anchor, ex-stock	725 lbs.
(1) Kedge anchor, ex-stock	392 lbs.
Chain cable, 1½″ stud	210 fms.
(1) Streamline, 3½″ steel wire	75 fms.
(1) Towline, 3¼″ steel wire	90 fms.
(1) Hawser, 6″ manila	90 fms.
(1) Hawser, 5″ manila	90 fms.

Rudder

Area	
Dia. Stock	
C. Press. abaft C. L. pintles	

Complement

Deck officers	3
Deck crew	6
Engineer officers	4
Engineer crew	7
Purser's and steward's department	5
Total officers and crew	25
First-class passengers	none
Second-class passengers	none
Third-class passengers	none
Total passengers	none
Total complement	25

Handling Equipment

	No.	Type	Capacity	Length
Mast	2	Pole	....	.....
Derrick posts	..	...	....	.....
Booms	4	wood	3 ton	34′ 0″
Discharging Cap.				

Deck Machinery

Steering Gear, Bethlehem steam gear with telemotor control.

Windlass (1), steam	6 × 6
Capstans (1), steam	6¼ × 8
Winches (4), steam	8¼ × 8

Life Saving Equipment

	No.	Type	Length
Lifeboats	2	.....	20′0″

Propelling Machinery

Boilers

Number	2
Type	B. & W. watertube
Length	
Width or Diameter	
Furnaces	
Fuel	oil
Draft	forced
Total heating surface, square feet	4,110
Total grate surface or furnace volume	
Superheat, degrees F.	
Working pressure, lbs. per sq. in.	180
Normal fuel consumption:	
Per day, tons	11
Per horsepower hour, pounds	1.14
Normal steam production:	
Per hour per pound of fuel	lbs.
Total per hour	lbs.

Engines

Number	2
Type	triple expansion, reciprocating
Size	11-18-29 by 20
Horsepower, total indicated	900

Propellers

Number	2
Type	semi-steel, 4 bladed
Weight, lbs	2,056
Diameter	6′ 9″
Pitch	6′ 9″
R. P. M.	180
Projected area, sq. ft.	17.95
Developed area, sq. ft.	21.5

Auxiliary Machinery

Machinery Space

Condenser (1), surface condensing type, 1,600 sq. ft. cooling surface.	
Evaporators	
Distiller	
Filters	
Feed water heater	(1)
Fuel oil heaters	(4)
Pumps	
Main feed, vert. simplex	8 × 5 × 12
Centrifugal circulating	5 × 7 engine
Air, vert. simplex	7½ × 14 × 10
Aux. feed, vert. simplex	8 × 5 × 12
Fire & bilge, horiz. duplex	9 × 5¼ × 10
Fresh water, horiz. duplex	4½ × 3¾ × 4
F. O. Service (2), vert. duplex	4½×3×4
F. O. transfer, horiz. duplex	5¼×4¾×5
Sanitary, horiz. duplex	5¼ × 4¾ × 5
Refrig. circulating, horiz. duplex,	7½ × 8½ × 6
Forced draft blower	4 × 4 eng.

Refrigerating Machinery

(2) York, 15 ton ammonia machines.

Electric Equipment

Generators (1)	7½ K. W.
Radio	
Emergency	

Holds

No.	Length	Hatches
1	32′ - 0″	12′ × 14′
2	46′ - 0″	12′ × 14′
3	46′ - 0″	14′ × 14′
4	46′ - 0″	14′ × 14′

Capacities

Cargo Space (Refrigerated)

Compartment	Cu. Ft.	Tons
Hold No. 1	16,256	171.11
Hold No. 2	25,147	264.70
Hold No. 3	25,162	264.86
Hold No. 4	25,134	264.56
Total	91,699	965.23

Bunkers

Compartment	Cu. Ft.	*Bbls.	*Tons
For'd deep tank (S)	2,407	....	59.10
" " " (P)	2,407	....	59.10
For'd bottom tank (S)	557	....	13.68
" " " (P)	557	....	13.68
Settling tanks (S)	388	....	8.30
" " (P)	338	....	8.30
After peak tank	904	....	22.18
Total	7,508	....	184.34

*38.1 cu. ft. per ton: ..... gals. per bbl

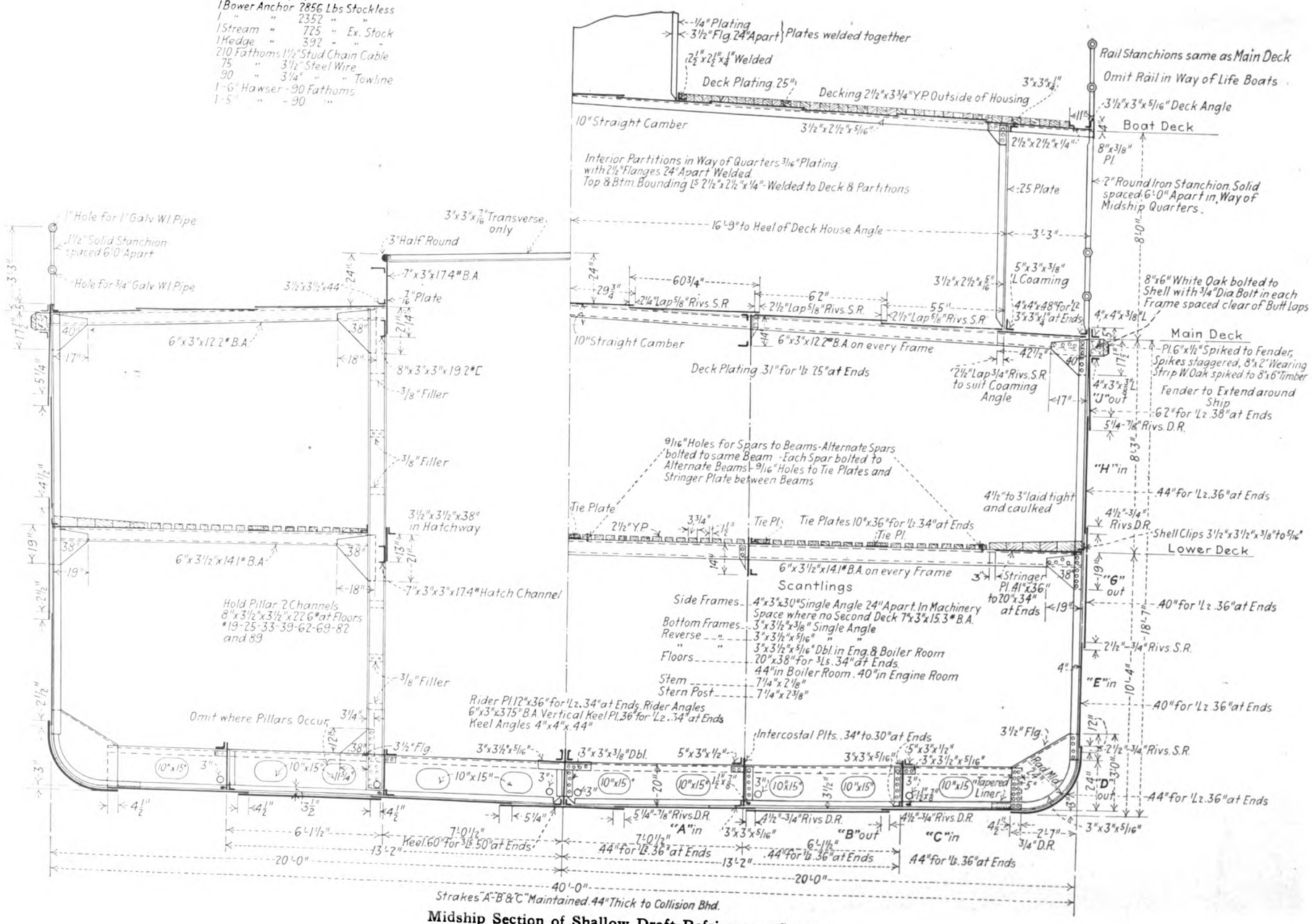
Tanks

Compartment	Cu. Ft.	Tons F. W.	Tons S. W.
Fore Peak	1,581	.....	45.0
After Peak	904	....	25.7
Drinking water	...	0.41	....
Sanitary	...	0.41	....
Total	2,485	0.82	70.7

Generated on 2024-09-12 11:24 GMT / https://hdl.handle.net/2027/mdp.39015080127403
Public Domain, Google-digitized / http://www.hathitrust.org/access_use#pd-google
Digitized by Google
Original from UNIVERSITY OF MICHIGAN

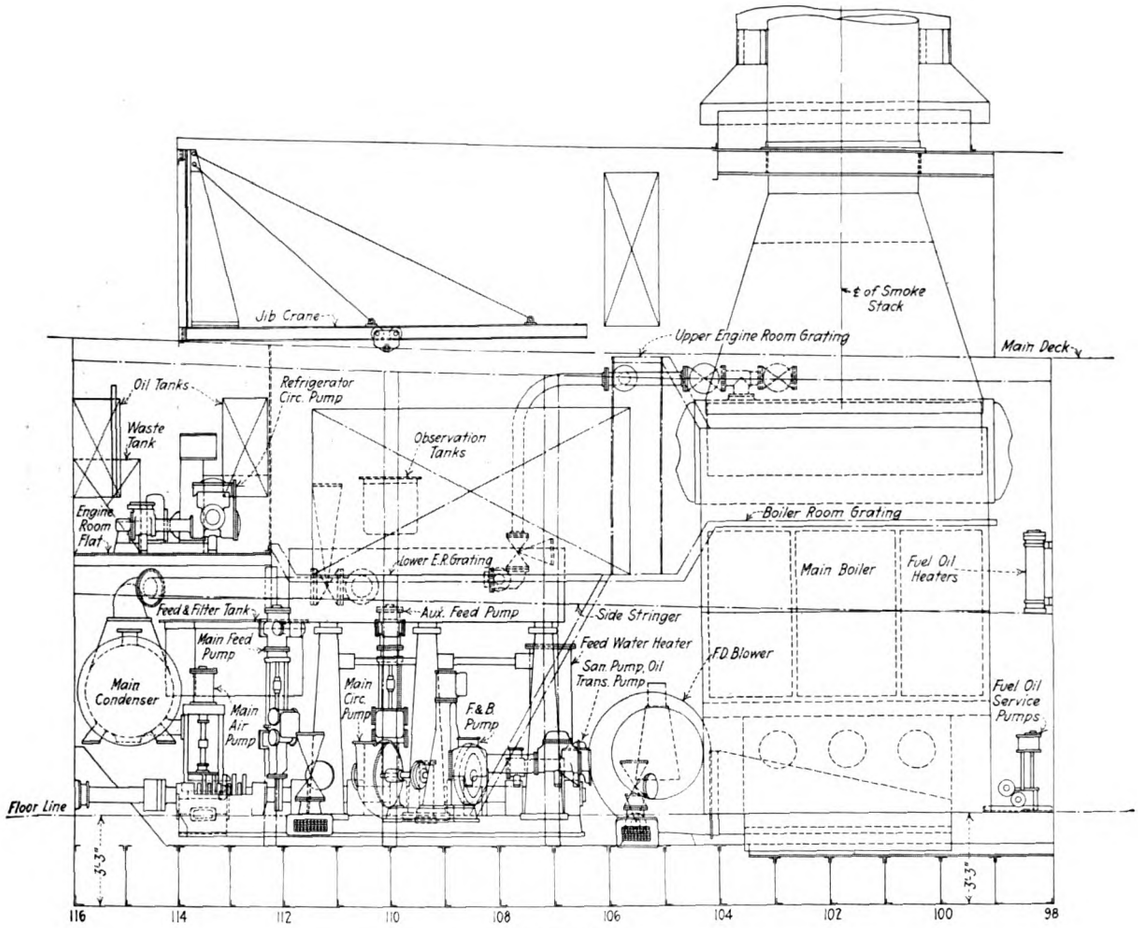
Generated on 2024-09-12 11:22 GMT / https://hdl.handle.net/2027/mdp.39015080127403
Public Domain, Google-digitized / http://www.hathitrust.org/access_use#pd-google

Digitized by Google

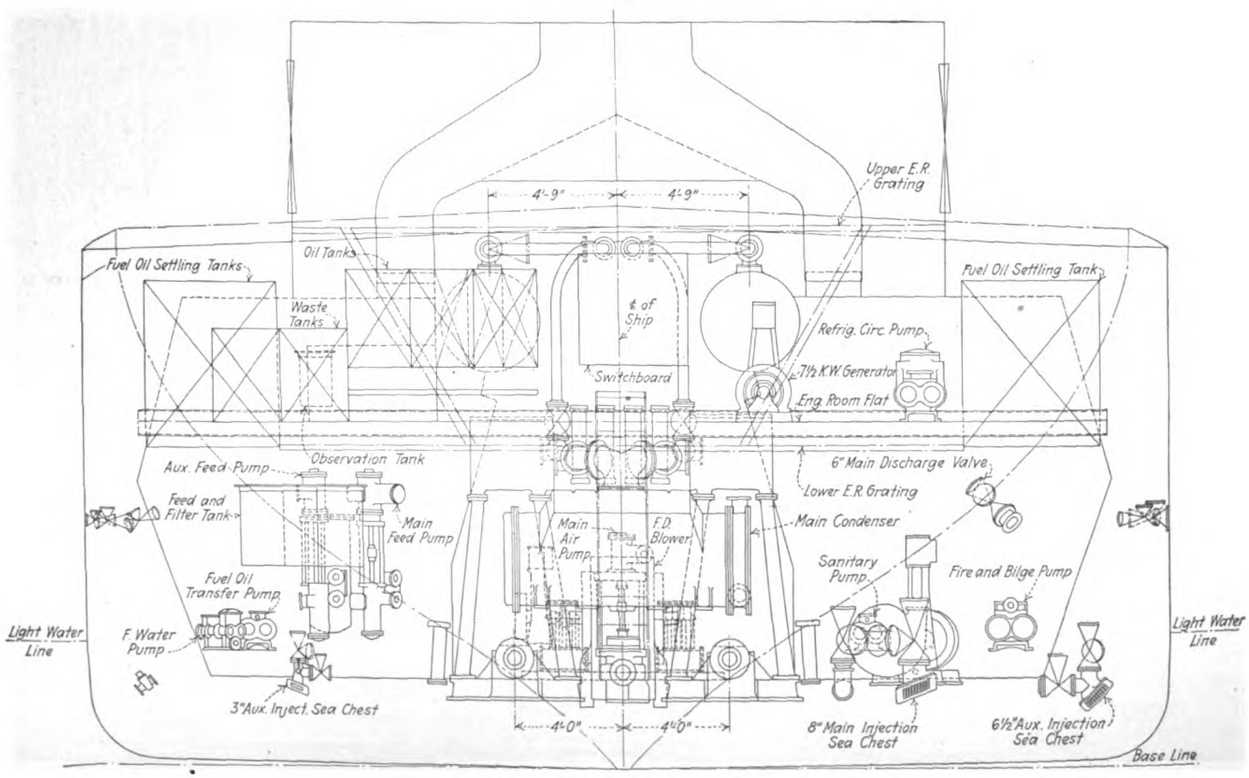

Equipment
1 Bower Anchor 7856 Lbs Stockless
1 " " 2352 " "
1 Stream " 725 " Ex. Stock
1 Kedge " 392 " "
210 Fathoms 1 1/2" Stud Chain Cable
75 " 3 1/2" Steel Wire
90 " 3 1/4" " " Towline
1-6" Hawser - 90 Fathoms
1-5" " - 90 "
1/4" Plating
3 1/2" Flg. 24" Apart } Plates welded together
2 1/2" x 2 1/2" x 1/4" Welded
Deck Plating .25"
Decking 2 1/2" x 3 1/4" Y.P. Outside of Housing
3" x 3" x 1/4"
10" Straight Camber
3 1/2" x 2 1/2" x 5/16"
Interior Partitions in Way of Quarters 3/16" Plating with 2 1/2" Flanges 24" Apart Welded
Top & Btm. Bounding Ls 2 1/2" x 2 1/2" x 1/4" - Welded to Deck & Partitions
Rail Stanchions same as Main Deck
Omit Rail in Way of Life Boats
3 1/2" x 3" x 5/16" Deck Angle
Boat Deck
8" x 3/8" Pl.
2" Round Iron Stanchion, Solid spaced 6'-0" Apart in Way of Midship Quarters.
.25 Plate
16'-9" to Heel of Deck House Angle
3'-3"
8'-0"
1" Hole for 1" Galv. W.I. Pipe
1 1/2" Solid Stanchion spaced 6'-0" Apart
Hole for 3/4" Galv. W.I. Pipe
3" Half Round
3 1/2" x 3 1/2" x 44"
3" x 3" x 7/16" Transverse only
7" x 3" x 17.4# B.A.
7/16" Plate
2 1/4"
6" x 3" x 12.2# B.A.
8" x 3" x 19.2# C
3/8" Filler
3/8" Filler
3/8" Filler
3 1/2" x 3 1/2" x 38" in Hatchway
6" x 3 1/2" x 14.1# B.A.
7" x 3" x 3" x 17.4# Hatch Channel
Hold Pillar 2 Channels 8" x 3 1/2" x 3 1/2" x 22.6# at Floors #19-25-33-39-62-69-82 and 89
Omit where Pillars Occur
3 1/4"
3 1/2" Flg
3" x 3 1/2" x 5/16"
3" x 3" x 3/8" Dbl.
5" x 3" x 1/2"
Rider Pl 12" x 36" for 'Lz. 34" at Ends, Rider Angles 6" x 3" x 3.75" B.A. Vertical Keel Pl. 36" for 'Lz. 34" at Ends
Keel Angles 4" x 4" x 44"
Intercostal Plts. 34" to 30" at Ends
3" x 3 1/2" x 5/16"
3" x 3 1/2" x 5/16"
Boat 1/4
5"
3"
3 1/2" Flg.
Tapered Liner
2 1/2" - 3/4" Rivs. S.R.
2 1/2" - 3/4" Rivs. D.R.
3" x 3" x 5/16"
3/4" D.R.
2'-7"
Keel 60" for 'Ls. 50" at Ends
7'-0 1/2"
6'-1 1/2"
13'-2"
20'-0"
40'-0"
Strakes "A" "B" & "C" Maintained .44" Thick to Collision Bhd.
"A" in
"B" out
"C" in
44" for 'Lz. 36" at Ends
6'-1 1/8"
Main Deck
Pl. 6" x 1 1/8" Spiked to Fender, Spikes staggered, 8" x 2" Wearing Strip W. Oak spiked to 8" x 6" Timber
Fender to Extend around Ship
4" x 3" x 3/8" "J" out
6 2" for 'Lz. 38" at Ends
5 1/4" - 7/8" Rivs. D.R.
8" x 6" White Oak bolted to Shell with 3/4" Dia. Bolt in each Frame spaced clear of Butt Laps
4" x 4" x 3/8" L
60 3/4"
29 3/4"
6 2"
55"
2 1/2" Lap 5/8" Rivs. S.R.
3 1/2" x 2 1/2" x 5/16"
5" x 3" x 3/8" L Coaming
4" x 4" x 48" for 1/2
3" x 3" x 1/4" at Ends
6" x 3" x 12.2# B.A. on every Frame
Deck Plating .31" for 'Lz .25" at Ends
2 1/2" Lap 3/4" Rivs. S.R. to suit Coaming Angle
9/16" Holes for Spars to Beams - Alternate Spars bolted to same Beam - Each Spar bolted to Alternate Beams - 9/16" Holes to Tie Plates and Stringer Plate between Beams
Tie Plate
2 1/2" Y.P.
3 3/4"
1 1/2"
Tie Pl.
Tie Plates 10" x 36" for 'Lz. 34" at Ends
Tie Pl.
6" x 3 1/2" x 14.1# B.A. on every Frame
4 1/2" to 3" laid tight and caulked
Stringer Pl. 41" x 36" to 20" x 34" at Ends
Shell Clips 3 1/2" x 3 1/2" x 3/8" to 5/16"
Lower Deck
"H" in
44" for 'Lz. 36" at Ends
4 1/2" - 3/4" Rivs. D.R.
"G" out
40" for 'Lz. 36" at Ends
2 1/2" - 3/4" Rivs. S.R.
"E" in
40" for 'Lz. 36" at Ends
"D" out
44" for 'Lz. 36" at Ends
Scantlings
Side Frames - 4" x 3" x 3.0# Single Angle 24" Apart In Machinery Space where no Second Deck 7" x 3" x 15.3# B.A.
Bottom Frames - 3" x 3 1/2" x 3/8" Single Angle
Reverse " 3" x 3 1/2" x 5/16" " "
" " 3" x 3 1/2" x 5/16" Dbl. in Eng. & Boiler Room
Floors - 20" x 38" for 3 Ls. 34" at Ends. 44" in Boiler Room. 40" in Engine Room
Stem - 7 1/4" x 2 1/8"
Stern Post - 7 1/4" x 2 3/8"

Midship Section of Shallow Draft Refrigerator Steamer

Original from UNIVERSITY OF MICHIGAN



ELEVATION



CROSS SECTION AT FR. NO. 116 LOOKING FORD

Sections Through Engine and Boiler Rooms: Shallow Draft Refrigerator Steamer

Generated on 2024-09-12 11:22 GMT / https://hdl.handle.net/2027/mdp.39015080127403
Public Domain, Google-digitized / http://www.hathitrust.org/access_use#pd-google
Digitized by Google
Original from UNIVERSITY OF MICHIGAN

throughout for transporting frozen or chilled meats from the company's plant at Asuncion to Buenos Aires. The refrigerating machinery consists of two 15-ton ammonia machines and is installed in a steel house on the upper deck forward of the officers' accommodation. During tests a temperature of 13 degrees F. was easily maintained in all holds.

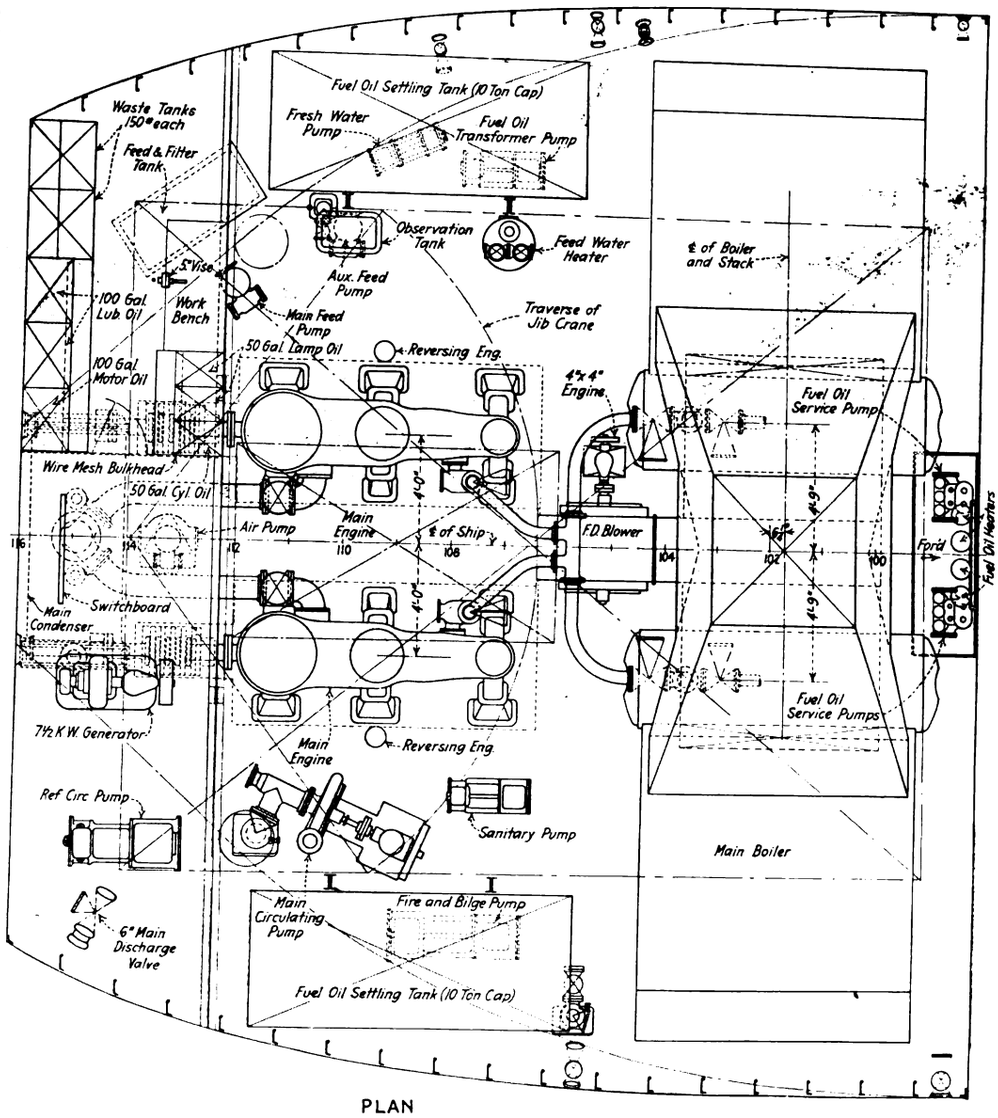
Each cargo hold is served by one winch and derrick for handling cargo overside into the ocean-going steamer or barges alongside.

ACCOMMODATIONS

Great care has been taken in laying out quarters to provide ample ventilation for the hot weather. Officers and engineers are quartered in a house amidships, all these rooms being outside. On top of this steel house accommodations are provided for the captain and owner. The owner's staterooms have all modern conveniences.

The crew are berthed in the raised forecastle.

A large dining saloon is provided in a steel house aft just forward of the stack, with the galley arranged on the starboard side and accommodations for the cook and steward on the port side.



PLAN

Plan of Engine and Boiler Rooms: Shallow Draft Refrigerator Steamer

The propelling machinery is placed aft and consists of two triple expansion engines capable of driving the vessel at a speed of 12 miles per hour. Steam is supplied by two Babcock & Wilcox oil burning watertube boilers. The boilers are designed to work under natural draft, but forced draft has been installed to take care of any and all conditions of weather encountered on river service. Three Lodi type burners are fitted to each boiler.

These steamers are the first to be built in this or any other country to be registered under the Paraguayan flag.

PLAN OF RELIEF FOR PIONEER PURCHASERS.—The Shipping Board on February 9 announced that it had decided upon a plan of extending some relief to the "pioneer" ship purchasers, who paid or agreed to pay high prices for their tonnage, providing they will purchase for cash additional tonnage of the ships the board now has for sale, on a basis that will enable them to average down or equalize the price of their total tonnage to a basis of present replacement cost, the price to be determined in accordance with the individual circumstances existing in each case, so that the capital charge will be reduced to a figure that will enable them to compete. The pioneer purchasers acquired some 150 ships aggregating 1,000,000 tons.

Individual High-Voltage Motors Operate Successfully on Tietjen and Lang Floating Dry Dock

ALTHOUGH 2,400-volt motors had previously been used on floating docks using a single motor to drive all pumps on a side where geared centrifugal pumps or bucket pumps were used, the Tietjen & Lang Dry Dock Company, Hoboken, N. J., was unable to locate satisfactory references of the use of individual pump motors for voltages higher than 440 when considering new equipment in 1920 for their No. 6 dock, which had been in operation since 1900 with steam driven bucket pumps.

It was decided to change this to a complete system of electrically controlled pumps and motors. This installation, which was supervised by W. H. Reed, electrical engineer for Tietjen & Lang, has now been in service about one year and offers an interesting service record of completely satisfactory performance under unusual conditions.

DESCRIPTION OF THE DOCK

The dock may be briefly described as consisting of sections or pontoons each 80 feet long with an extreme width of 111 feet. Each pontoon is divided into three compart-

Generated on 2024-09-12 11:20 GMT / https://hdl.handle.net/2027/mdp.39015080127403
Public Domain, Google-digitized / http://www.hathitrust.org/access_use#pd-google
Digitized by Google
Original from UNIVERSITY OF MICHIGAN

Fig. 1.—Tietjen and Lang Floating Dry Dock No. 6

ments of equal size by longitudinal bulkheads. The depth of the pontoons is 12 feet 3 inches and the height from the deck of the pontoons to the deck of the wing is 29 feet. These pontoons when placed together form a dock having an overall length, including outriggers, of 468 feet. A photograph of the dry dock is shown in Fig. 1.

The pumping equipment formerly consisted of twelve plunger pumps in each pontoon. These pumps were actuated through reduction gears by line shafts which extended along the decks of the wings, one on each side, and were driven by upright steam engines which, with their boilers and auxiliary equipment, were located on the decks of the wings of the center pontoon.

After considerable investigation of the type and form of apparatus best suited to meet the particular requirements, the pumping equipment of the Alberger Pump and Condenser Company, New York, and the electrical equipment as manufactured by the General Electric Company, Schenectady, N. Y., were selected.

The New Pumps and Motors

The pump equipment was somewhat unusual in that self-alining guide bearings on the intermediate shaft, as recommended by the manufacturer, were used with complete success in avoiding any strains on the shaft from the slight distortion occurring in a wooden dock. All pumping equipment was manufactured by the Alberger Pump and Condenser Company, one pump being located in the center compartment in each wing of each of the five sections, a total of ten pumps, each with an individual motor, permitting the utmost flexibility in control. The suction lines leading from each pump are terminated by foot valves which bring the suction within a few inches of the bottom of the pontoons. The vertical shafts of the pumps have been extended up through the wing spaces and steadied by self-alining bearings, and end in flexible couplings on a level with the decks of the wings. Just below the flexible coupling thrust bearings of the roller type are placed, which sustain the weight of the pump shafts and impellers.

The electrical equipment consists of ten General Electric vertical, squirrel cage type, 360 revolutions per minute, constant speed induction motors, designed for 75 horsepower capacity in 150 horsepower frames and for use on 2,400-volt, 2-phase, 60-cycle alternating current circuits. The motors are coupled by means of flexible couplings to the shafts of the pumps.

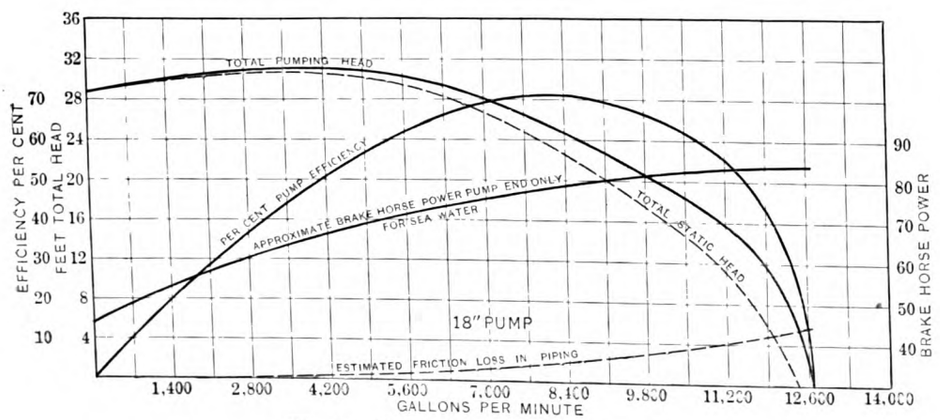


Fig. 2.—Pump Characteristic Curves

The motors are housed in wooden structures which are arranged to be heated electrically to prevent condensation through temperature changes which might otherwise affect the life of the motor insulation, due to "breathing."

Push Button Control

The control equipment for the motors has been installed in a fireproof brick structure near the head end of the dock. The equipment consists of ten push button control automatic starting compensators, each having a capacity of 75 horse-

Generated on 2024-09-12 11:22 GMT / https://hdl.handle.net/2027/mdp.39015080127403
Public Domain, Google-digitized / http://www.hathitrust.org/access_use#pd-google
Digitized by Google
Original from UNIVERSITY OF MICHIGAN

power. These compensators are banked together to form a five-panel switchboard and have their disconnecting switches, current limiting and overload relays on the front of slate panels with the contactors and compensation coils mounted on iron pipe frame work.

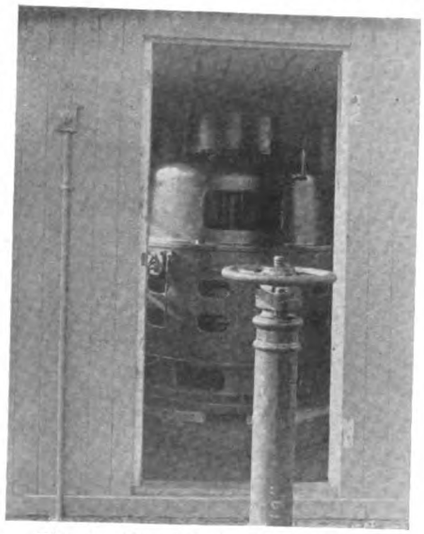


Fig. 3.—One of the Pump Motors

The push buttons controlling the starting and stopping of the motors are grouped on a slate panel which is twenty-four inches square. This is shown in Fig. 4.

When the dock is being operated the push button control panel is in charge of an operator who receives his instructions from the dock master. As the motors are of constant speed, his duties consist of starting and stopping the motors as directed. A bell system for signalling from the outboard end of the dock has been arranged for transmitting instructions from the dock. At other times the operator receives manual signals from the dock master at the inboard end of the dock.

Electric Circuit System

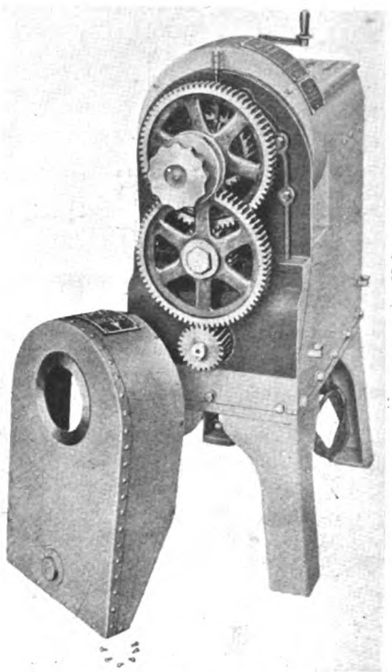
The electric circuit system can be described briefly. Each motor is on a separate circuit and all circuits originate in the control building. Iron conduits are installed from the control house of two wood structures. One of these is on the inboard end of each side of the dock. Rubber-insulated, lead-encased cables designed for 5,000 volts service are used. To make connection between the wood structure and the dock special extra flexible cable, known as "dry dock cable," is used. The circuits are carried along the outboard side of the dock in iron conduits and terminate in brass connection boxes at the ends of the section. The connection boxes are arranged with fiber spacers and filled with insulation compound. Connections between the sections are made with "dry dock cable." Particular attention has been given to making the wiring system watertight and special precautions taken to have all parts of the system "grounded" where required.

Fig. 4.—Push Button Control Board in Dock Master's Office

It is of additional interest to know that a portion of this equipment was installed during the time that the dock was still being operated by means of the old steam equipment and bucket pumps, the dock being out of service to complete the installation of the new pumps, piping and electrical equipment only sixteen calendar days until the first lift was made with the new equipment, this time being sufficient also for the removal of the old steam equipment and its pumping gear. The new equipment was put into complete service on October 26, 1920, and has operated with complete satisfaction.

Rotary Brake Sounding Machine for Depths Up to 100 Fathoms

SOUNDINGS up to a depth of 100 fathoms without decreasing the speed of a vessel or losing the lead and wire have been made with a new Lietz rotary brake type sounding machine which consists of a mechanical sounding device driven by a General Electric one horsepower motor. A special feature of the machine, which is an improved type of a former design, is the brake mechanism which consists of a mounted shaft having a hollow portion on which the reel for the wire revolves. The brake clutch is rigidly mounted and is operated through the hollow portion of the shaft by means of a screw which, engaging with the rolling members in the hollow portion of the shaft, causes expansion and contraction of the brake clutch which rotates with the reel and shaft while winding in.



Lietz Rotary Brake Sounding Machine

The braking mechanism is actuated by a brake wheel on the outside of the casing and acts on the reel gradually, preventing its stopping suddenly with the consequent loss of the wire and lead. An indicator is located on the case near the brake wheel which shows which way to turn it to free the reel and let out the wire or to brake the wheel for winding.

Although normally designed for operation by a one horsepower motor, the device is arranged so that it can be worked manually if desired. In this case disconnecting the motor from the gearing is unnecessary as the motor armature acts as a flywheel. All parts of the machine are easily accessible for inspection or repair.

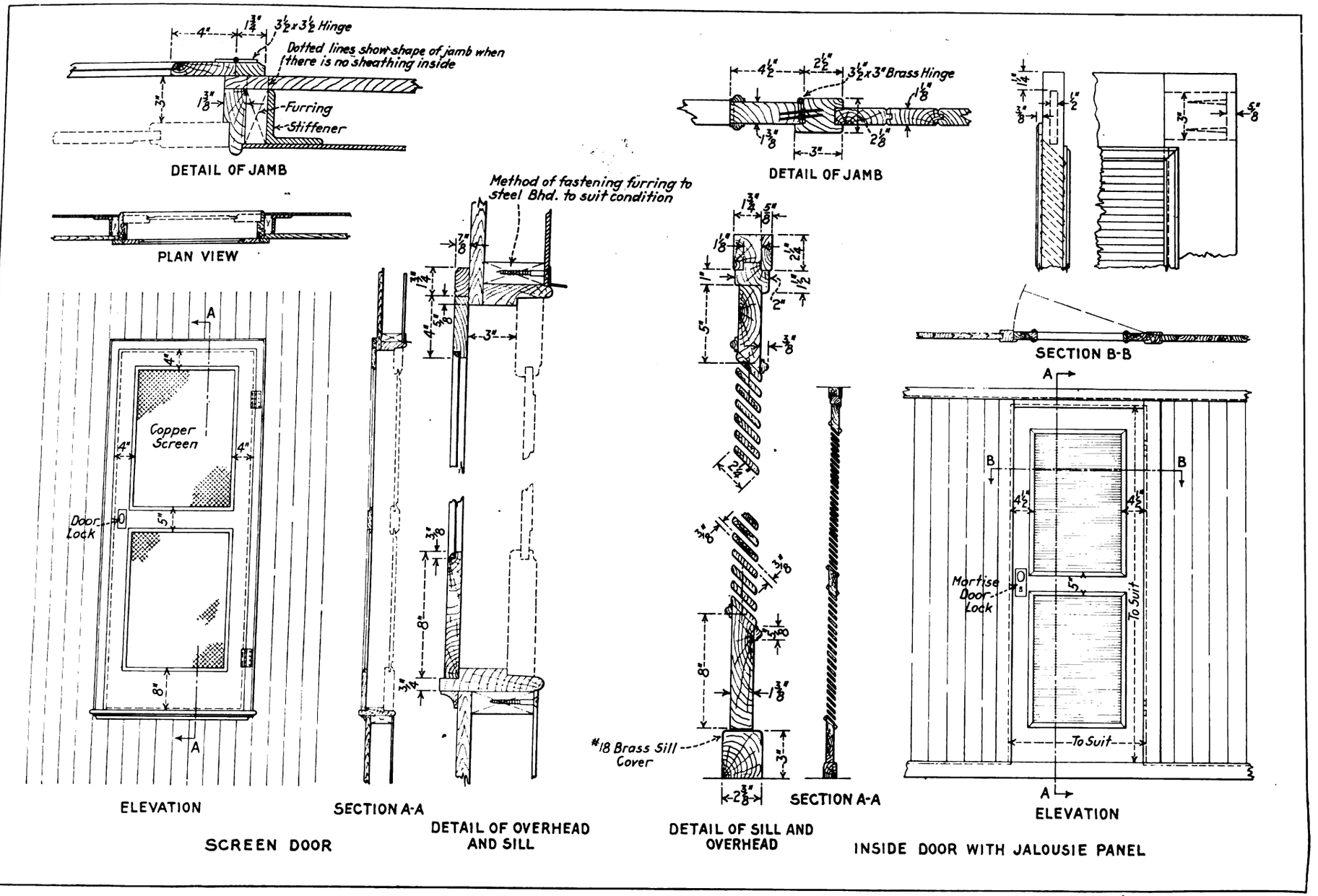
Munson Line Gets New Ships.—A. J. Frey, vice-president of the United States Shipping Board Emergency Fleet Corporation, in charge of operation, has announced that the *Pan-American*, formerly the *Palmetto State*, has successfully completed her trial trip and has been delivered to the Munson Line of New York, which will operate her in the South American service. Mr. Frey also announced that the *Western World*, formerly the *Nutmeg State*, now in process of completion at the Sparrows Point yard of the Bethlehem Shipbuilding Corporation, will also be delivered to the Munson Line the last week in April, to be placed in the same berth. With the completion of this vessel the Shipping Board construction program will come to an end.

Generated on 2024-09-12 11:24 GMT / https://hdl.handle.net/2027/mdp.39015080127403
Public Domain, Google-digitized / http://www.hathitrust.org/access use#pd-google
Digitized by Google
Original from UNIVERSITY OF MICHIGAN

Generated on 2024-09-12 11:31 GMT / https://hdl.handle.net/2027/mdp.39015080127403
Public Domain, Google-digitized / http://www.hathitrust.org/access_use#pd-google

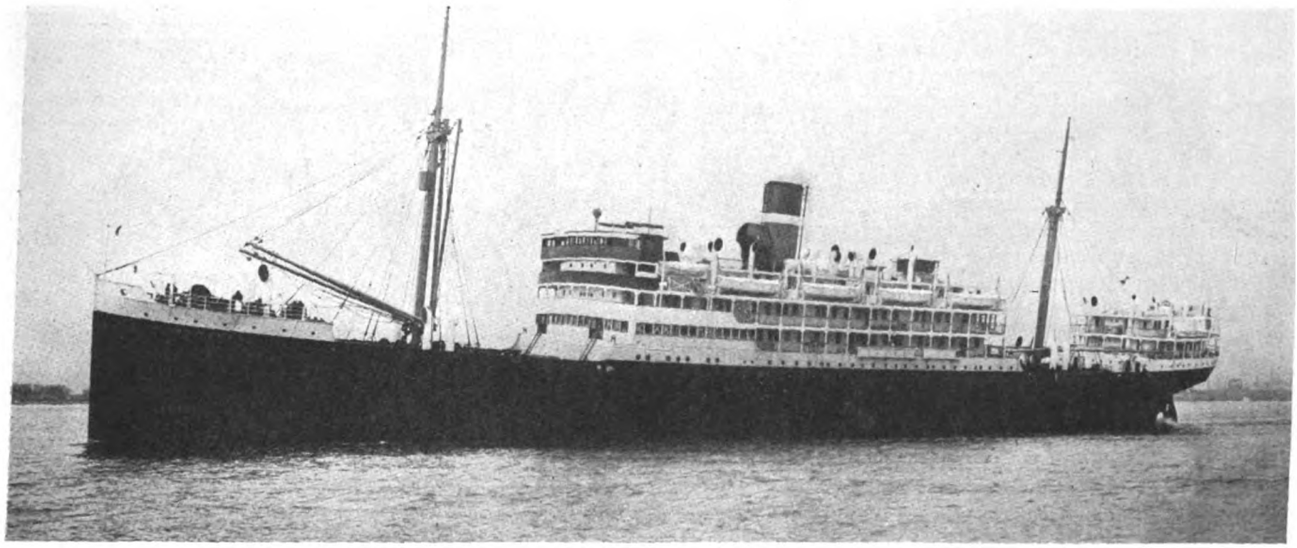
Ship Joiner Plans

Inside Doors



Digitized by Google
Original from UNIVERSITY OF MICHIGAN

INSIDE DOOR WITH JALOUSIE PANEL



Munson Liner Munargo, Built for Passenger and Freight Service to the West Indies

New Munson Liner Munargo Goes Into Service

Fifteen-Knot Geared Turbine Passenger Steamer, Built by New York Shipbuilding Corporation, Added to Munson Fleet

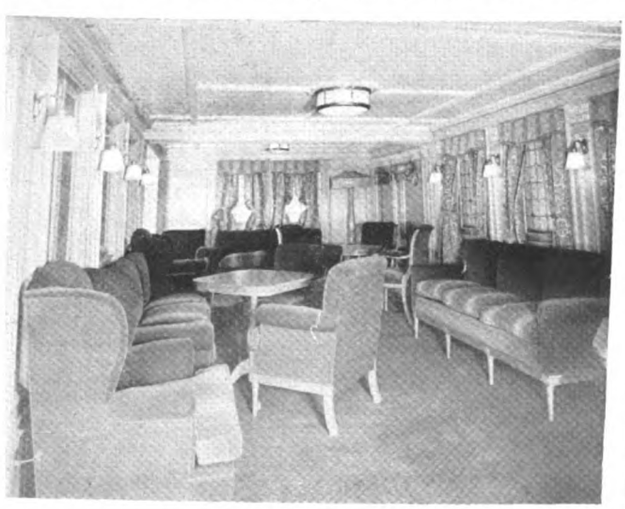
THE latest addition to the increasing fleet of the Munson Steamship Line, New York, is the passenger and cargo ship *Munargo,* recently completed at the plant of the New York Shipbuilding Corporation, Camden, N. J. The new vessel is 414 feet long and 57 feet 6 inches beam, with a draft of 23 feet 8 inches. She has accommodations for 185 first class, 60 second class, and 52 third class passengers with a crew of 119, and in addition has a cargo capacity of 2,000 tons.

Driven by reduction geared turbines of 5,800 horsepower, supplied with steam from five boilers, fired by fuel oil, the *Munargo* will maintain a speed of 15½ knots in service. The boilers are of the Scotch type and the turbines of the Parsons type driving the propeller through DeLaval reduction gears.

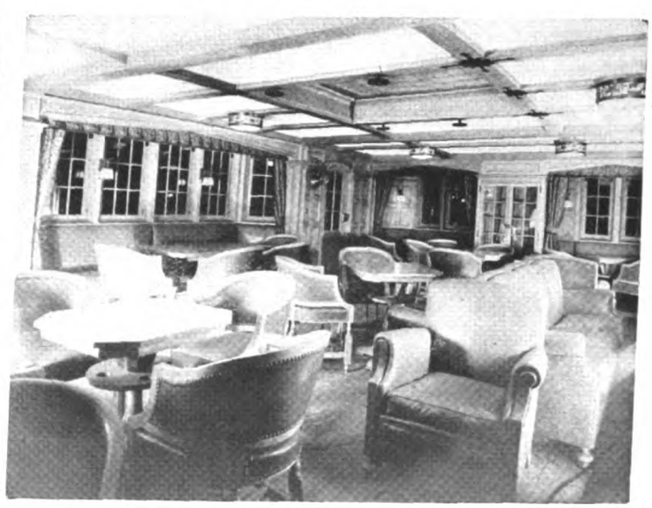
The staterooms are replete in modern conveniences, including specially designed dressing tables, beds, electric fans, etc. The old type of berth has been largely superseded by specially designed enamelled beds. The suite rooms on the promenade deck are finished in a light natural grey toned to match the hangings while the trim is either mahogany or French walnut, according to the period of the furnishings. The suite rooms, as well as the special rooms on the bridge deck, have their own private bath rooms connecting.

The public rooms are numerous, light, airy and exquisitely finished. They include a social hall, lounge and music room, smoking room, library and writing rooms, entrances and galleries. A sun and dancing deck for first class passengers has been provided on the boat deck over the smoking room.

The dining saloon is located on the shelter deck, over the center of which is located a large dome and light well opening into the music room. Tables are arranged for small and large parties. Specially designed buffets, etc., blend harmoniously with the surroundings.



Lounge



Smoking Room

Generated on 2024-09-12 11:26 GMT / https://hdl.handle.net/2027/mdp.39015080127403
Public Domain, Google-digitized / http://www.hathitrust.org/access_use#pd-google
Digitized by Google
Original from UNIVERSITY OF MICHIGAN

An extensive refrigeration plant is installed with separate compartments for meat, fish, vegetables, butter and eggs, etc., and is of ample capacity for any emergency.

Ventilation and heating throughout the ship have been cared for in a very complete manner, insuring comfort at all times whether in the intense heat of the tropics or the extreme cold of the North Atlantic.

Separate complete hospitals are provided for passengers and crew, fitted with modern appliances.

Accommodations for the second and third class passengers are all aft and far surpass the accommodations furnished in older ships. Public rooms, including a social hall, smoking and music rooms, are provided to insure comfort at all times.

Accommodations for the officers and crew are for the most part located on the boat deck with enclosed companion ways for access, so there is no need of coming in contact with the passengers.

The ship has been built on the transverse system of framing and to take the highest class in the American Bureau of Shipping and Lloyd's Register. The *Munargo* starts her career as an oil burner, but is so designed that conversion to coal will not be a difficult matter should it become desirable.

Dining Room

Together with the other additions to the Munson Line this class of ship will go a long way towards eliminating the absence of passenger vessels under our flag in the West India and South Atlantic services.

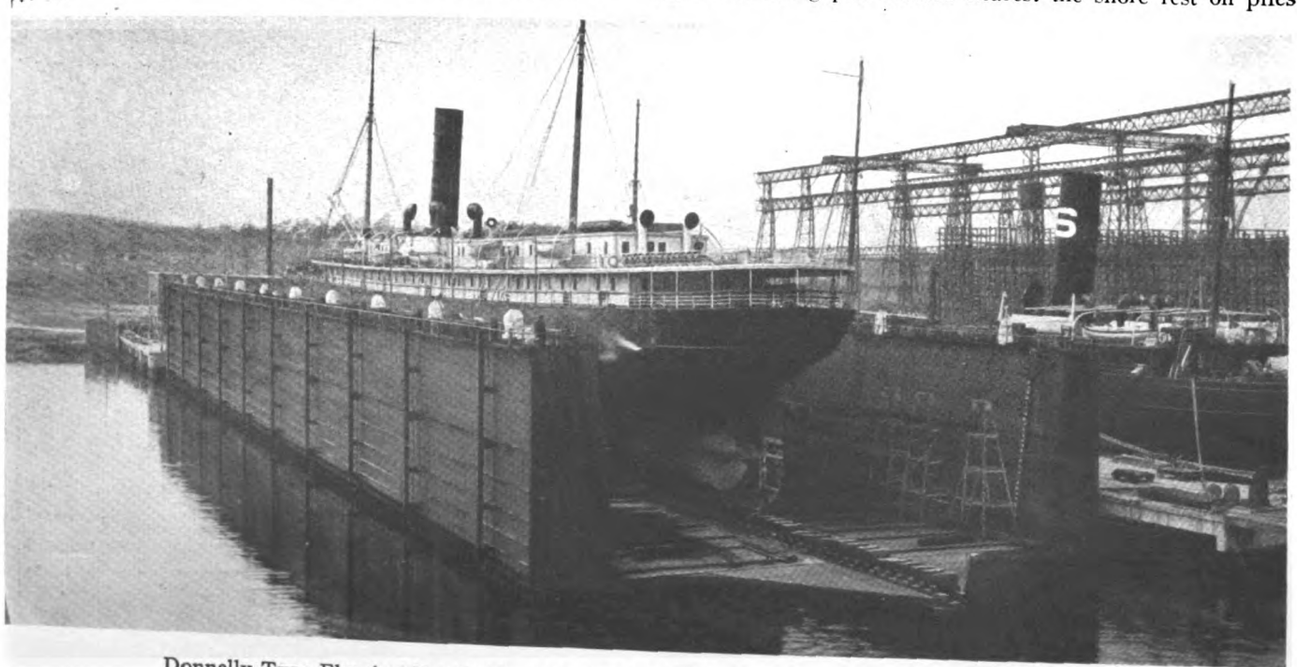
New Floating Dry Dock at Fore River Shipyard

Bethlehem Shipbuilding Corporation, Ltd., Installs a 10,000-Ton Dry Dock of the Donnelly Type at Its New England Plant

THE only floating dry dock on the Atlantic coast between Halifax and New York City is located at the Fore River plant of the Bethlehem Shipbuilding Corporation, Ltd., Quincy, Mass. Supplemented by the large machine, boiler and plate shops of the shipbuilding plant, this dock offers excellent facilities for serving the port of Boston.

The dry dock is of the well-known Donnelly type and has a capacity of 10,000 tons. In order to give berthing space to vessels requiring attention without the necessity of docking, a repair basin is provided adjoining the dock. Transportation facilities and crane service for vessels in either the dock or repair basin are carried on a mooring pier that is 50 feet wide and 616 feet long, measured from the bulkhead line.

On this pier are located two standard gage railroad tracks and the track for a 15-ton tower crane. The standard gage tracks are imbedded in the concrete in order to leave a clear roadway for motor trucks and other vehicles. The third rail for the crane and the pipe lines are placed in trenches along the sides of the pier, so arranged as to make T-beams of the adjoining crane stringers. In order to allow for shrinkage and expansion due to changes in temperature, two transverse expansion joints are provided in the deck of the mooring pier. Projections of the sliding floor beams, which engage corresponding recesses in the stationary floor beams, prevent the pier from getting out of alinement. The columns supporting the mooring pier located nearest the shore rest on piles



Donnelly Type Floating Dry Dock of 10,000 Tons Lifting Capacity at the Fore River Shipyard

Generated on 2024-09-12 11:21 GMT / https://hdl.handle.net/2027/mdp.39015080127403
Public Domain, Google-digitized / http://www.hathitrust.org/access_use#pd-google
Digitized by Google
Original from UNIVERSITY OF MICHIGAN

while the columns located in deep water rest on bed rock.

The dry dock consists of ten wooden pontoons under continuous steel side wings. A timber outrigger projects from each end pontoon. Two shore bridges leading from the head pier to the deck give access to the latter, and a swinging ramp connects the port wing wall to a steel landing tower near its in-shore end. The vertical motion of the dock due to the tides and when submerging or rising is guided by side and end moorings anchored to the concrete piers.

Each pontoon is 116 feet wide and 40 feet 10 inches long. The wing walls are 418 feet 9 inches long and 35 feet high, tapering on the inside from a width of 13 feet at the bottom to 8 feet 6 inches at the top. Connection between the pontoons and wing walls is made by means of links. Each link engages two pins, one of which is attached to the pontoon and the other to the wing wall.

The pumps for discharging the water from the pontoons and wings when the dock is raised are electrically operated from a control house on shore. Electrical connections are such that by means of individual switches the pumps of any pontoon can be operated independently of the others or, by means of a master switch, the pumps of all pontoons can be operated simultaneously.

This feature provides means whereby the stresses in the vessel being docked may be equalized by utilizing the individual control and bringing decreased or increased upward pressure to bear on certain pontoons, as required.

The first vessel docked was the *Miller County,* on February 12, 1921. The completion of the dock has filled a long-felt want in providing vessels entering the port of Boston with convenient and modern facilities for having repairs made to hull or machinery.

The British Shipbreaking Industry

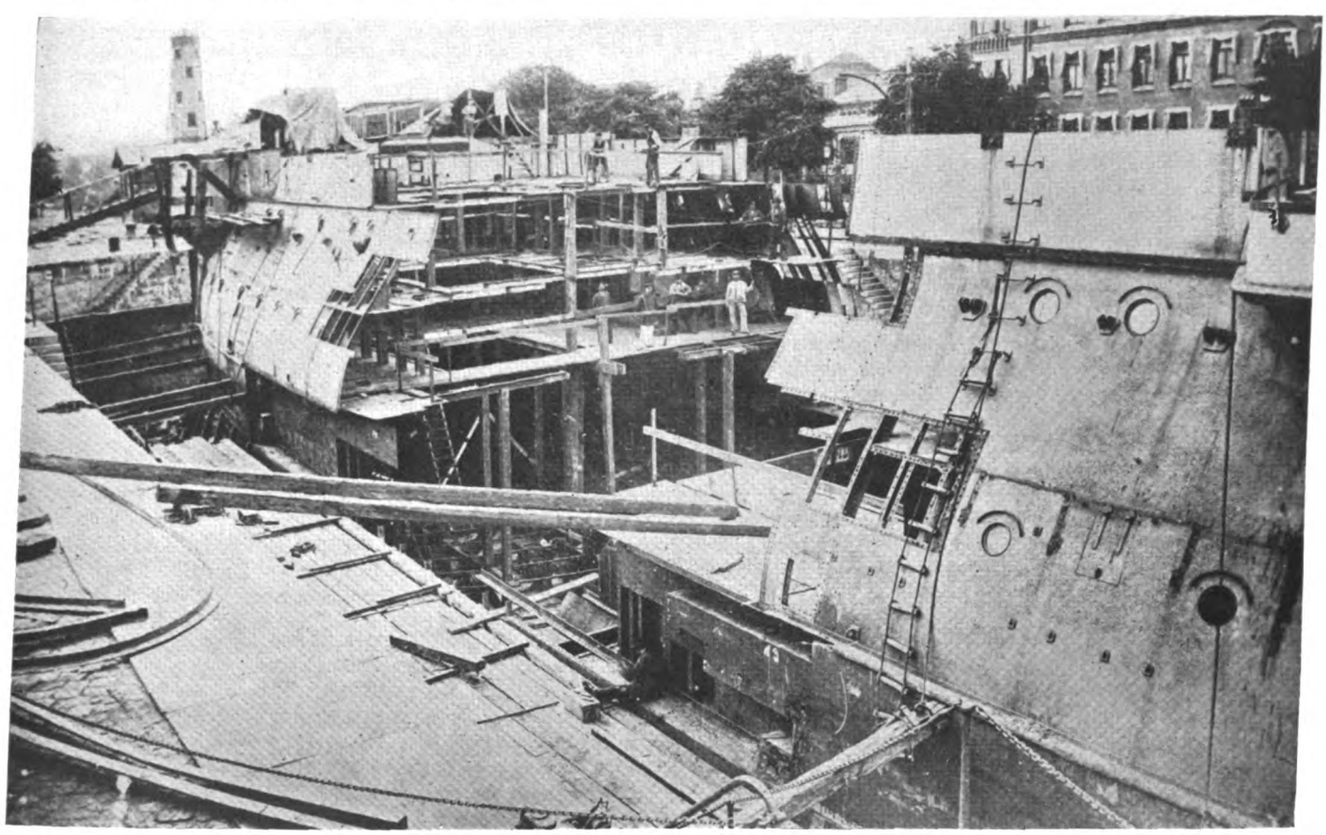
Non-Ferrous Metals Are Most Valuable—Hardwoods Sold for Furniture—Steel Cut Up for Melting

By Our London Correspondent

THE shipbreaking yards of the United Kingdom are at the present time veritable hives of industry. During the war, when tonnage was so precious, every vessel, no matter what its age or condition, was able to secure its freight and the shipbreaking trade fell into abeyance, but, with the cessation of hostilities and the flooding of the market with new vessels, the industry entered into its own, with the result that probably every shipbreaking yard in the country has enough work to keep it going at all events for the current year. And in the background looms the Washington Conference, with its gigantic scrapping of warships to add to the mercantile marine break-up.

PROCESS ADOPTED BY THOS. W. WARD, LIMITED

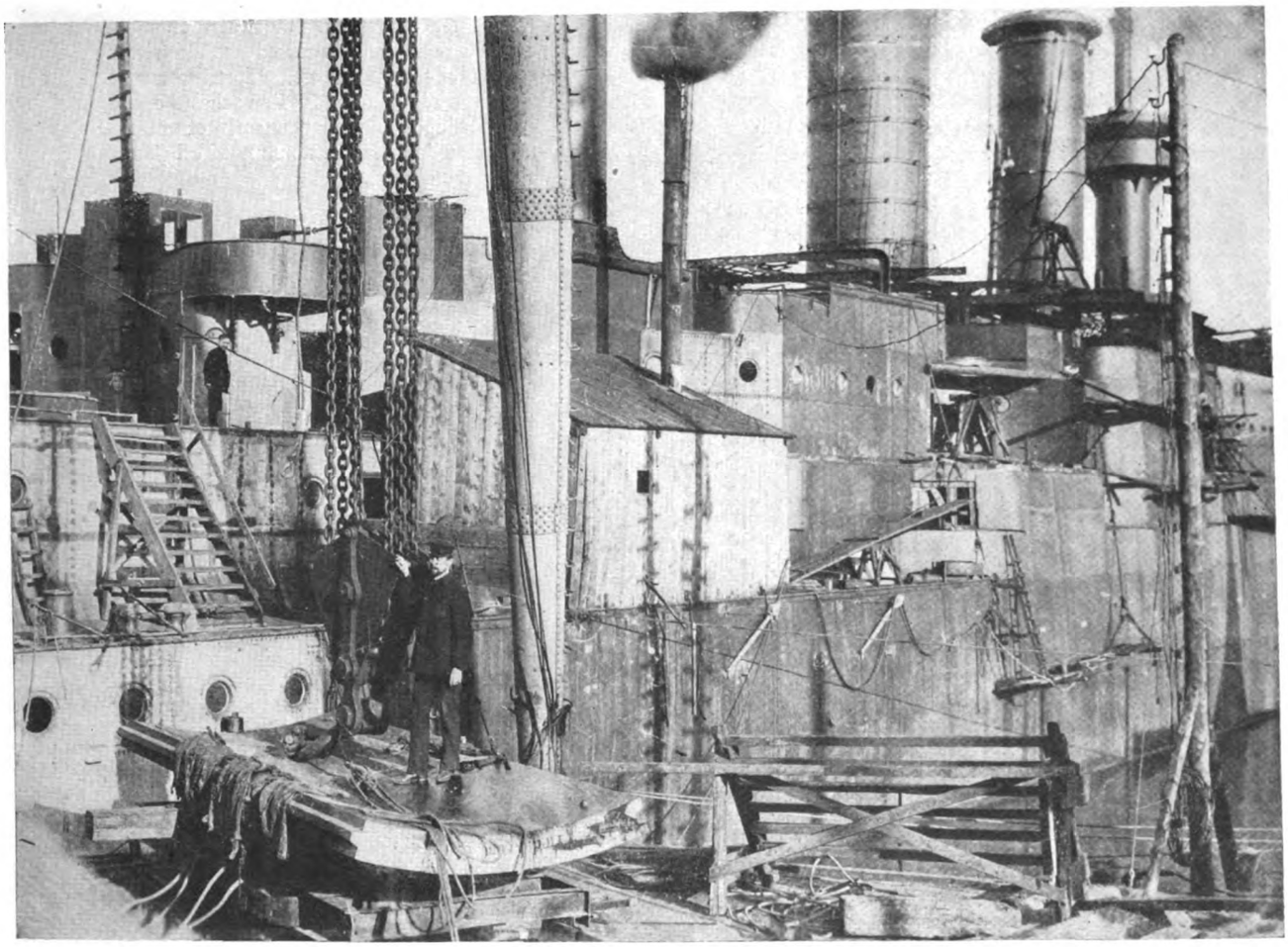
One firm, the introduction of whose name into an article of this description needs no apology, is Thos. W. Ward, Lim-



(Photograph copyright by Kadel & Herbert News Service, N. Y.)

Breaking Up a German Warship in a Dry Dock

Generated on 2024-09-12 11:22 GMT / https://hdl.handle.net/2027/mdp.39015080127403
Public Domain, Google-digitized / http://www.hathitrust.org/access_use#pd-google
Digitized by Google
Original from UNIVERSITY OF MICHIGAN



(Photograph copyright by Kadel & Herbert News Service, N. Y.)

Removing Armor Plate from German Warship While Afloat

ited, of Sheffield. The process adopted by Messrs. Ward in destroying a warship is a highly developed one. The first operation is to remove the deck fittings, and then comes the difficult operation of taking up the deck. At this point I should make it clear that it is not the practice to take out the engines and boilers in the early stages of breaking up, this being left until the upper portions of the vessel have been dealt with. The engines and boilers are thus easier to get at. For the deck lifting operation, oxygen and acetylene are combined to eject from a pipe a flame of great intensity. Large squares are cut out of the decks and swung by crane on to the quay. With the disappearance of the decks, the engines and machinery come to view and with wrench and hammer the breakers detach large portions for the crane to lift clear. Then come the compartments, the officers' quarters, the boilers and the shaft. Having come to the empty shell, the oxy-acetylene flame gets to work again, and the sides of the hull are cut into squares. On the quay, steam shears cut pieces of steel into sizes that will fit the furnaces for which they are intended, most of the steel finding its way to South Wales, where it is melted down.

A Stripping Method

The method adopted by another well-known firm in demolishing vessels is to strip them of their metal, machinery, fittings and equipment, but, before selling the metal, this is cut up into crucible sizes, as there is a more ready market. The teakwood is removed very carefully and is usually sold to people in the furnishing line. With regard to the hulk, this is also cut up into furnace size by means of the oxy-acetylene burning plant. At present, owing to the slump in the scrap trade, this is hardly a paying proposition but a little improvement on current prices would certainly make it so.

A firm which does not break up iron and steel ships, but limits its work to old wooden battleships, tows them from the dockyards to its shipbreaking wharf, where they are demolished, the timber being converted into whatever it will make. Americans, I am told, are buyers of old ship oak for building purposes, where the antique design is carried in this material.

Pitfalls Await the Inexperienced

The pitfalls for those about to establish shipbreaking businesses are many, even for the wary, and the advice of Mr. Lawrence Levy, one of the most experienced men in the shipbreaking industry in Great Britain, is, similarly to that of *Punch* to those about to marry—"Don't!" *En passant,* it is interesting to note that the company of which Mr. Levy is managing director—the Shipbreaking Company, Limited, of London, Swansea, etc.—has dealt with all types of vessels during the past quarter of a century, and since the armistice has undertaken the demolition of no fewer than twenty-five ex-German submarines, in addition, of course, to other craft.

To those embarking on breaking up submarines Mr. Levy tells me that the first essential point to bear in mind is to clear the vessels absolutely of oil—whether fuel or lubricating. His firm strips the boats to their very bottoms, for the simple reason that, if the steel were not stripped entirely, a considerable quantity of metal would go to waste. It is not

Generated on 2024-09-12 11:26 GMT / https://hdl.handle.net/2027/mdp.39015080127403
Public Domain, Google-digitized / http://www.hathitrust.org/access_use#pd-google
Digitized by Google
Original from UNIVERSITY OF MICHIGAN

the custom to take the hulk out and sink it; but, by the time the breakers have achieved their work at the wharf the portion of the vessel remaining is negligible and it is then finished on the beach. In the big battleships there is, it is true, a certain amount of teak and so on to be salvaged but in the majority of cases there is little of real value beyond the scrap non-ferrous metals. Mr. Levy emphasizes that, when engaged on submarines in docks, it is advisable to have somebody on board—as, for example, an ex-naval officer—to supervise the dismantling.

WAGES AN IMPORTANT FACTOR

As I have indicated, Mr. Levy does not regard the profession of shipbreaking as a means to easy and plenteous wealth, more particularly at the present time when wages and most other charges are high and the value of the metals obtained stands at only a tithe of their figure during the war, consequent on the trade depression and the superabundance of new metal at low costs. With regard to wages, Mr. Levy instances that, whereas in this country shipbreakers' employees receive about £3 for a week of forty-seven hours, in France the corresponding wage is equivalent, at the present rate of exchange, to about seven shillings for a ten-hour day. The wages cost alone in Great Britain represent, therefore, nearly double those just across the English channel; so the value of the steel portion of the vessels does not cover the cost of recovering the steel scrap.

In view of the depreciated rate of exchange in Germany, it is scarcely surprising that some of the contracts in the hands of British shipbreakers have been transferred to German yards, to the mutual advantage of the contractors and sub-contractors.

Motorship Building in Europe

Motorships Without Auxiliary Compressors—Geared Diesel Vessels—New Types of Engines

By Our Special London Correspondent

SCARCELY a month passes without bringing forth some striking innovation in motorship machinery. Having apparently convinced shipowners that the modern marine oil engine is equally as reliable as a steam plant, manufacturers are tending towards simplified construction, mainly with the idea of reducing the cost of building. At present the machinery of a motorship costs some 20 to 25 percent more than that of a corresponding steamer equipped with reciprocating engines and shipowners are demanding that this somewhat considerable difference should be reduced. So far as can at present be gathered, the tendency will be towards simplification and therefore cheapening of auxiliary machinery, the development of compressorless Diesel engines and more efficient standardization in manufacture. By this means various firms are hopeful that within the next two or three years, the engine room installation of a motor vessel will cost no more than that of a steamer.

An example of this line of thought is seen in the motorship *Handicap,* which sailed on her maiden voyage at the beginning of the year. The propelling plant of this vessel is in any case a noteworthy installation, embodying as it does the first examples of the new Sulzer two-stroke engine using turbo scavenging blowers instead of large piston pumps driven direct from the engine crankshaft. A fully illustrated description of this arrangement was recently published in MARINE ENGINEERING AND SHIPPING AGE and need not be repeated. It may, however, be remarked, surprising as it would appear, that by installing two turbo blowers in the engine room each driven by a 150 brake horsepower electric motor, there is an actual saving in weight as compared with similar engines driving their own scavenging air pumps as are usually installed.

These turbo blowers occupy very little space, being arranged in enclosed compartments in the wings of the vessel and the engines, being naturally reduced in length by the elimination of the scavenging pump, allow of an engine room

1,350-Ton Single Screw Motorship Balzac, a New Type for Service in European Waters

Generated on 2024-09-12 11:53 GMT / https://hdl.handle.net/2027/mdp.39015080127403
Public Domain, Google-digitized / http://www.hathitrust.org/access_use#pd-google
Digitized by Google
Original from UNIVERSITY OF MICHIGAN

probably shorter than that of any vessel equipped with machinery of equal power (2,700 brake horsepower).

What is most remarkable in this ship, however, is that there is no auxiliary air compressor. The air required for starting and maneuvering purposes is supplied wholly from the blast injection compressors on the main engines and on those used for driving the dynamos. This system has never previously been employed and although the cost of one or two electrically driven compressors is avoided it is somewhat doubtful whether the plan is desirable. The builders claim that there is plenty of compressed air available above that required for the fuel injection, and that it is unnecessary to install two further maneuvering compressors. It is improbable that any British shipowner would agree to take the risk thus involved, the vessel being Norwegian owned. Indeed it is somewhat doubtful whether an installation of this sort would pass Lloyds. Nevertheless, if it is perfectly successful, it may have a far reaching effect for the result is an engine room of extreme simplicity, comparing favorably with most other installations.

Geared Diesel Ship for the Hamburg-American Line

Whether there is a future for the geared Diesel ship as some shipbuilders and shipowners appear to imagine is a controversial question and the Hamburg-American Line has shown some temerity in putting two such vessels in service. The second ship, the *Munsterland,* was completed early in February. She is exactly similar to the first vessel of this class, being 465 feet in length and having a deadweight capacity of nearly 11,000 tons. There are two ten cylinder four cycle engines installed, which run at 230 revolutions per minute although originally designed for a much higher speed. They develop 1,650 brake horsepower each, and drive the propellers through a reduction gear of 2.7 to 1 so that the propellers turn at 85 revolutions per minute.

Whatever may be said regarding the reliability of engines of this type the Hamburg-American Line has undoubtedly acquired motorships costing less than any other vessel of their size built during the past few years. It is understood that the engines, which were originally designed for large German submarines, were obtained at a very low figure and, owing to their lightness, the deadweight capacity of the vessels is larger than almost any others of corresponding dimensions.

New Types of Diesel Engines

Unanimity of Diesel engine design seems as far off as ever. Several new types have been brought out during the past month or two. The first Beardmore Tosi engine has been completed and installed in the 2,500-ton motorship *Pinzon.* This motor is noteworthy chiefly from the adoption of a combined inlet and exhaust valve which, it is claimed, overcomes exhaust valve trouble and avoids the frequent cleaning necessitated with the ordinary design.

Another new engine is a 1,200 brake horsepower set, constructed by the Atlas Diesel Company of Stockholm, of the two cycle type which goes one better than the Sulzer and provides a design in which each cylinder cover has only one valve, namely the fuel valve. Scavenging air enters, and the exhaust gases are discharged, through ports in the cylinder liner and starting is effected by enclosing the bottom of the cylinder and causing the lower section of the cylinder below the piston to act as a maneuvering engine when starting and a scavenging pump when the motor is running. This naturally involves a somewhat complicated system of air distribution and it is questionable whether the system is an improvement upon the Sulzer method with the starting valve in the cylinder cover. The scavenging air supplied in this way from the six working cylinders below the piston is not sufficient for the requirements of the engine so that there is an additional scavenging pump driven by a beam lever from one of the crossheads. This engine has just passed through its trials for installation in a single screw 5,000-ton cargo vessel.

Another German Design

The third new type is that developed by the Deutsche Werke in Kiel at the old Royal Naval Dockyard. The first examples of the engine are about to be installed in an 8,000-ton motor tank ship. Like so many other German builders, the Deutsche Werke decided to adopt the four-cycle principle and there is little that is original in the construction except that each engine is made self-contained with its air compressor, lubricating oil, circulating water and general service pumps, driven by levers off the engine crossheads. This again has been adopted with the idea of reducing the cost of construction and of minimizing the number of auxiliaries in the engine room.

Something of a revolution is predicted in Diesel engine construction in the near future although a great deal of secrecy is observed at the present time. A new engine is being built by two or three of the leading Continental manufacturers, the main advantage of which is the elimination of the compressor. This is effected, not by employing mechanical injection at very high pressure as has already been adopted in several successful engines, but by another device which enables the fuel to be pumped through the fuel valve at a pressure of only a few pounds per square inch. It is expected that the new design will be placed on the market in the very near future and a very considerable reduction in cost of construction compared with the air blast type is anticipated.

14,000-Ton Motorship

The Royal Mail Steam Packet Company has just taken delivery of its first motorship, a vessel of 14,000 tons deadweight named *Lochkatrine.* This is the largest type of oil engined vessel afloat, equipped with twin screw machinery of 6,400 horsepower built by Harland and Wolff of the usual Burmeister and Wain design. The fuel consumption of this ship when carrying a full cargo at a speed of about 13½ knots is about 20 tons daily.

Another interesting new vessel is the *Dominion Miller,* built by Doxfords for the Furness Withy Company and representing the second ship equipped with the remarkable 3,000 horsepower Doxford opposed piston oil engine. Incidentally it may be remarked that the manufacturers of this type are so satisfied with its performance that they are now quoting for single engines up to 6,000 brake horsepower. In order to demonstrate that the opposed piston engine can run on boiler fuel oil a seven days' trial was recently made, using Mexican fuel oil (.95 specific gravity), the results of which were, it is stated, completely satisfactory and the fuel consumption no higher than when utilizing high grade Diesel oil.

Combination Portable Drill and Grinder

A NEW portable combination machine for hand drilling and grinding operations has been developed by the Wodack Electric Tool Corporation, Chicago, Ill. The tool is so designed that the motor has the correct speed for both drilling and grinding. The drilling capacity is ⅛-inch to ⅝-inch holes in steel and when used as a grinder it is fitted with a 6-inch by ¾-inch wheel. The complete weight of the machine is 18 pounds and the motor under service develops ½ horsepower.

Boiler Scale Investigation.—The Bureau of Mines has undertaken, at the Pittsburgh Experiment Station, an investigation of the mechanism of scale formation in steam boilers. The object of the investigation is to determine if the character of the precipitates forming in boilers may be made to assume a form in which they do not attach themselves to the walls, and also to ascertain if the material in the boiler wall exercises any influence.

Generated on 2024-09-12 11:23 GMT / https://hdl.handle.net/2027/mdp.39015080127403
Public Domain, Google-digitized / http://www.hathitrust.org/access_use#pd-google
Digitized by Google
Original from UNIVERSITY OF MICHIGAN

Effect of Vacuum Upon Economy in Marine Practice*

Vessel's Income Depends Upon Securing Maximum Ton Miles Per Ton of Fuel, Which Is Largely Influenced by the Vacuum Obtained

By Frank V. Smith†

As the income of a ship depends upon ton miles, it must also depend upon the speed of the vessel and the number of days actually at sea. Any condition that delays a ship in port, or delays its speed at sea, means just so many less ton miles and, therefore, less income.

An engineer is very apt to say that he cannot see that his job affects the income of a ship in any way and that the running of the ship, that is the executive end of it, is all done in the office and, therefore, all he has to do is to follow orders. We will consider one item to bring out more clearly why the engineer of a ship has a great responsibility and in what way he holds in the palm of his hand the making or breaking of the merchant marine.

Consider a turbine ship of the type that we are most familiar with—a 2,500 shaft horsepower turbine with double reduction gears. The power derived from a pound of steam depends upon the initial steam conditions, that is, pressure and superheat, or, taking the two items collectively, the total heat of the steam and the final pressure or vacuum. The difference in the heat content of the steam in its initial and final state, therefore, becomes the direct measurement of power. In a theoretical sense it does not matter what the initial and final pressures are as long as the same definite quantity of heat has been utilized and converted into power per pound of steam.

The steam consumption of a turbine, regardless of the power extracted by the turbine itself, is dependent upon the initial pressure, superheat and nozzle area. If we assume a case where the power derived from the same quantity of steam at the same initial pressure differs on account of the difference in vacuum obtained and know definitely how this power affects the speed of the ship, it presents an interesting analysis, for it directly affects the ton miles per year and, therefore, the income.

One Inch of Vacuum Equals About 75 Pounds of Initial Pressure

One inch of vacuum will roughly amount to from five to seven percent of the fuel, but do not think for one minute that this additional fuel is being used to make up for the loss in vacuum for it is not. With the loss in vacuum the fuel consumption is remaining the same, for the steam consumption is the same and will remain the same unless the initial pressure is increased to make up for the deficiency in vacuum so that the same pound of steam could liberate the same amount of heat. This, to my knowledge, has never been done on any of our ships. To make up for a loss of even one inch of vacuum it would be necessary to raise the initial pressure 75 pounds or more, and it is not at all likely that any engineer who has been in the habit of carrying a boiler pressure of 210 pounds gage would immediately upon the loss of one inch of vacuum raise the boiler pressure to almost 300 pounds. The fuel consumption is remaining the same as long as the initial pressure is the same and it simply means that there has been less power liberated for the same amount of fuel. Figured in terms of fuel per shaft horsepower hour, facts of this kind soon become evident in the analysis of the various reports.

Generally speaking, a typical cargo vessel, in order to pay operating expenses, with only a fair return on the capital investment, must average from 60 to 70 percent of a cargo when operating from 35,000 to 40,000 miles per year. Under this condition the average income should be, when figured on a knot basis, from $11.00 to $14.00 per knot, varying slightly with the valuation of the vessel. As a basis for future estimates on the value of vacuum, power and speed on a ship of from 7,800 to 9,000 tons deadweight carrying capacity a very fair average of $13.00 per knot will be used.

Assuming the same steam consumption, pressure and superheat and, therefore, the same fuel consumption, a variation in the vacuum will affect the power, speed and knots per year approximately as shown in the following table:

Effect of Vacuum

Initial pressure, 200 pounds, gage; 75 degrees F., superheat.
No. of nozzles open, 12.
Assumptions: (a) Designed speed of ship, 11.5 knots at 2,500 shaft horsepower.
(b) Value of ship at sea, $3,600 per day or $13.00 per knot.

Vacuum in Inches	S.H.P.	Knots per Hour	Knots per Day	Knots per Year 150 Days	Loss in Knots per Year	Loss in Dollars per Year at $13.00 per Knot
28	2500	11.5	276	41400	0	0
27	2285	11.16	267.84	40176	1224	$15,912.
26	2120	10.88	261.12	39168	2232	29,016.
25	1980	10.62	254.88	38232	3168	41,184.

Another interesting analysis would show that if the original vacuum of 28 inches was maintained instead of 27 inches the same power might be had with one-sixth less steam per hour or in round numbers about 5,000 pounds of steam per hour. This amount of steam per hour represented in terms of fuel, providing the boiler efficiency remained the same would be approximately four tons of fuel oil per day. If the oil was worth $12.00 per ton and the ship was steaming 150 days a year this would amount to $7,200 per year.

There are two ways then in which you might have saved money. The first was to get the better vacuum, therefore full power and speed, make a greater mileage per year which is the true representation of the ship's earning value and in the typical case shown represented nearly $16,000 per year in increased earning capacity, or in the second case get the better vacuum, shut off two nozzles, save five thousand pounds of steam per hour or four tons of fuel per day and amounting in a year's time to $7,200.

Value of Trained Engineer

You can readily see that in either case an engineer who does not fully understand the value of high vacuum in connection with turbine installations is a costly investment to any operating company. He not only wastes fuel that is worth more than his salary but also decreases the speed of the ship unnecessarily and places it in a field where it cannot possibly meet the keen competition of today, and which means either bankruptcy for the operating companies or the immediate tying up of the vessel to avoid loss. You have seen enough of the evidences of the latter movement so that it will not be necessary to go into the details regarding this feature.

When you consider the fact that if only ten men a year, who were trained at the Shipping Board schools, which were maintained at the various manufacturing plants, were successful in maintaining the proper vacuum on these ships that it would either increase the earning capacity of the same number of vessels $160,000 (an inch to the man) or result in the saving of $72,000 per year in fuel, you can gain some idea as to the value of a trained engineer.

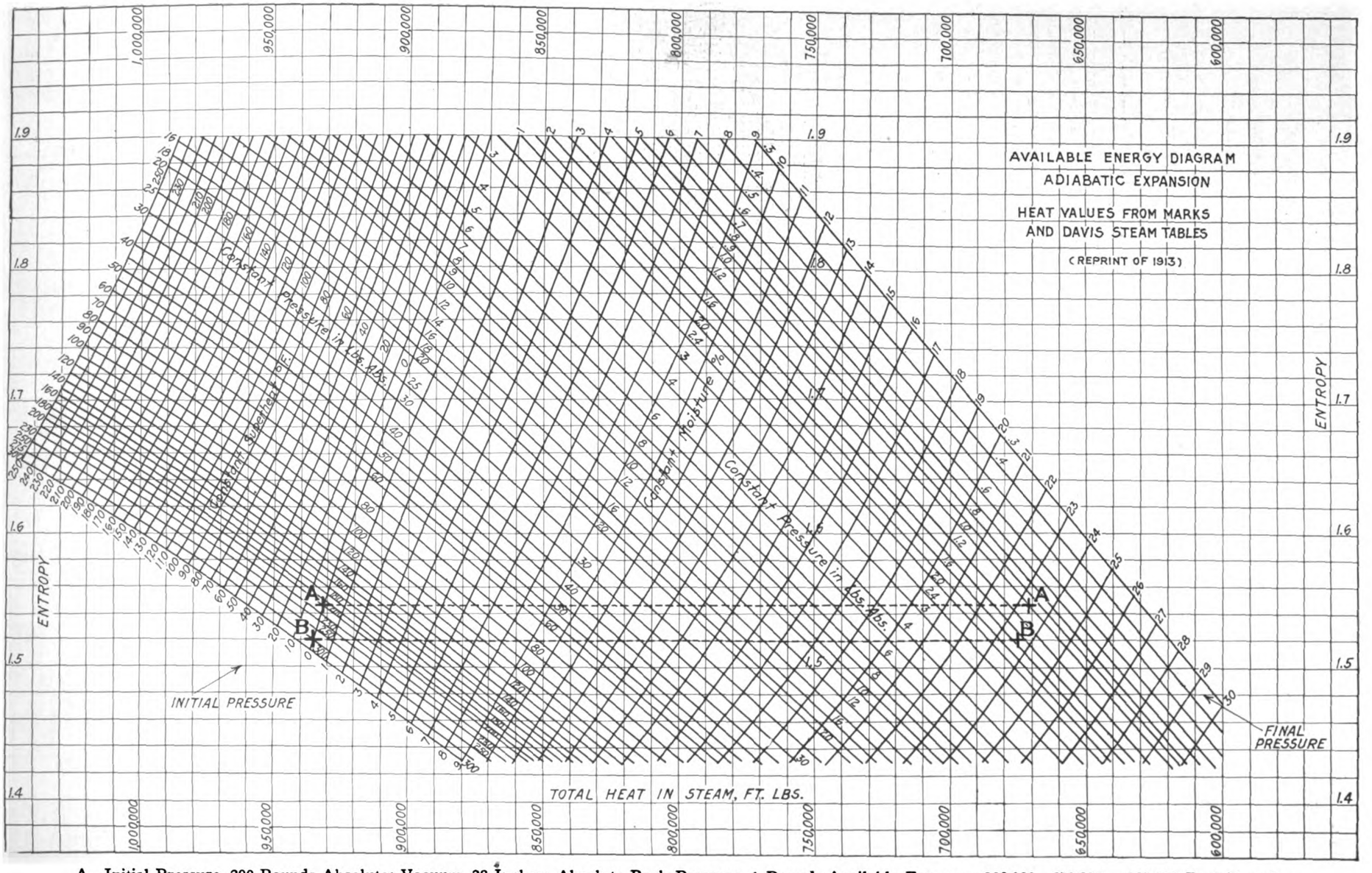
*Abstract of paper read before a meeting of the Marine Engineers' Beneficial Association, New York, January 23, 1922.

†Marine Engine Department, General Electric Company, Schenectady, N. Y.

Generated on 2024-09-12 11:48 GMT / https://hdl.handle.net/2027/mdp.39015080127403
Public Domain, Google-digitized / http://www.hathitrust.org/access_use#pd-google
Digitized by Google
Original from UNIVERSITY OF MICHIGAN

Generated on 2024-09-12 11:23 GMT / https://hdl.handle.net/2027/mdp.39015080127403
Public Domain, Google-digitized / http://www.hathitrust.org/access_use#pd-google

Digitized by Google



A—Initial Pressure, 200 Pounds Absolute; Vacuum, 28 Inches; Absolute Back Pressure, 1 Pound; Available Energy = 932,000—670,000 = 262,000 Foot Pounds
B—Initial Pressure, 275 Pounds Absolute; Vacuum, 27 Inches; Absolute Back Pressure, 1.5 Pounds; Available Energy = 935,000—675,000 = 260,000 Foot Pounds

Original from UNIVERSITY OF MICHIGAN

Appendix

The mathematical calculations of steam are quite complex. As a general rule in turbine calculations the "Total Heat"—Entropy Diagram ("The Mollier Chart") is used and the work done graphically as far as possible. These charts are obtainable with Marks and Davis' "Steam Tables." In our work, however, we go a step further by using a chart in which the total heat is multiplied by the mechanical equivalent of heat (1 B.T.U. = 777.5 foot-pounds) in order that the result may be in foot-pounds and the theoretical water rate be more readily obtained.

Example: (1) Initial pressure, 200 pounds, vacuum 28 inches --(2) Initial pressure 275 pounds, vacuum 27 inches—are marked respectively "A" and "B" and worked out on the accompanying Available Energy Diagram and also by mathematical calculation.

FORMULA FOR CALCULATION OF AVAILABLE ENERGY

The formula for calculating the available energy of steam expressed in foot-pounds, either dry or superheated, when expanding adiabatically to any back pressure, is seldom found in handbooks or textbooks, and when such formulas are found they are rather complex and difficult to use. The formula can, however, be made very simple when expressed as the difference between the total heat input and the heat left in the liquid together with the latent heat in the mixture at the lower pressure. The formula then becomes:

Available energy in foot-pounds =

$$778\ [H_1 + C_p t_1 - (q_2 + x_2 r_2)]$$

H_1 = Total heat of saturated steam at intial pressure p_1.
C_p = Specific heat of superheated steam.
t_1 = Degrees F. superheat at pressure p_1.
q_2 = Heat of the liquid at lower pressure p_2.
x_2 = Quality of the steam at pressure p_2.
r_2 = Latent heat at pressure p_2.

All of these quantities are found in any steam table except x_2 (dryness factor) which is, however, easily calculated from the fact that the entropy is constant before and after the expansion.

Entropy of superheated steam is:

$$C_p \log_e \frac{T_1 + t_1}{T_1} + \frac{r_1}{T_1} + \phi_1$$

Entropy of moist steam is:

$$\frac{x_2 r_2}{T_2} + \phi_2$$

By making these equal and solving for x_2 there results:

$$x_2 = \frac{T_2}{r_2}\left(C_p \log_e \frac{T_1 + t_1}{T_1} + \frac{r_1}{T_1} + \phi_1 - \phi_2\right)$$

T_1 = Absolute temperature at pressure p_1.
T_2 = Absolute temperature at pressure p_2.
ϕ_1 = Entropy of water at pressure p_1.
ϕ_2 = Entropy of water at pressure p_2.

AVAILABLE ENERGY OF ONE POUND OF STEAM EXPANDED ADIABATICALLY

STEAM CONDITIONS AND CALCULATIONS

		"A"	"B"
1.	Initial pressure, lbs. abs.	200	275
2.	Total heat initial pressure, B. T. U., ...	1,198.1	1,202.9
3.	Entropy of steam, initial pressure	1.5456	1.5199
4.	Final pressure, lbs. abs.	1.0	1.5
5.	Total heat, final pressure, B. T. U.	1,104.4	1,110.5
6.	Heat of water, final pressure....	69.8	83.7
7.	Entropy of water, final pressure..	.1327	.1573
8.	Entropy of steam, final pressure..	1.9754	1.9417
9.	Entropy of complete evaporation = (8-7)	1.8427	1.7844
10.	Entropy of evaporation to condition at end of expansion = (3—7)	1.4129	1.3626
11.	Final quality = (10+9)	.765	.763
12.	Heat at end of expansion = 6+ [11 x (5—6)]	861.27	867.15
13.	Available heat ($H_1 - H_2$) = (2—12)	336.83	335.75
14.	Available energy in ft. lbs. = ($H_1 - H_2$) × 777.5	261,885.0	261,046.0
15.	Theoretical water rate per H. P. hour = $\frac{1,980,000}{(14)}$	7.6	7.6
16.	Actual water rate per S. H. P. = $\frac{(15)}{\text{Turbine Efficiency}}$		

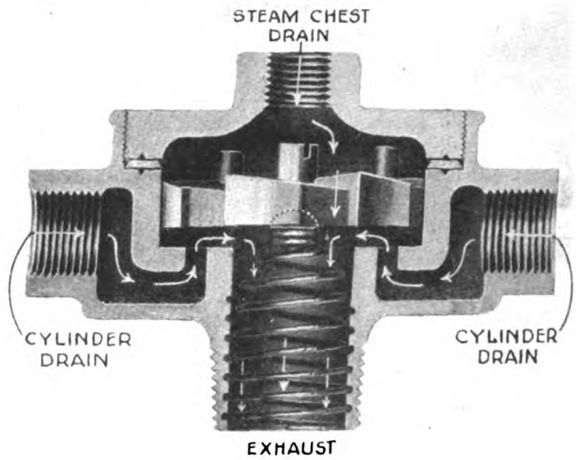
From the above calculations it is obvious that the amount of available energy that may be transformed into useful work in a turbine is practically the same in both cases (less than 1/3 of 1 percent difference and in favor of the lower initial pressure and higher vacuum).

All heat values were taken from Marks & Davis' "Steam Tables."

Automatic Drain and Relief Valve for Steam Reciprocating Equipment

FOR draining condensate and water from the cylinders and steam chests of reciprocating steam operated equipment the automatic relief valve being distributed by the Diel-More Sales Company, Inc., Philadelphia, Pa., has, in a wide application to equipment of this kind, tended to decrease the maintenance and repair costs by permitting the oil to function properly.

The valve is made entirely of brass and includes but one moving part—a self-grinding disk valve. The spring which supports the disk valve is adjustable, which feature permits



Sectional View of Automatic Drain and Relief Valve

considerable latitude in the pressure necessary to actuate the valve. When the engine or pump on which the valve is installed is at rest, the adjustable spring raises the disk valve thereby permitting the water to escape through by-passes to the waste pipe which eliminates the possibility of the operator neglecting to open the ordinary hand operated drain cocks after stopping the engine. Positive drainage is thus provided which prevents water remaining in the cylinder and freezing in the event of a shut down in cold weather. When the engine is operating, the disk valve is seated by the pressure carried in the steam chest (which pressure is constant).

The by-pass feature mentioned is claimed to be advantageous for direct connected engines (such as locomotives). With ordinary cylinder drain cocks exhausting hot air alternately to the atmosphere cold drafts of air are sucked in with each stroke of the piston. This air is objectionable and dangerous to hot cylinders, frequently causing warping or even cracking. Since the new valve does away with all ordinary drain cocks the liability of warping or cracking from this cause is also eliminated.

The valves are supplied with steam chest connections from ¼ to 1 inch diameter with either two or four parts and exhaust pipes from ½ to 1½ inches in diameter.

Generated on 2024-09-12 11:55 GMT / https://hdl.handle.net/2027/mdp.39015080127403
Public Domain, Google-digitized / http://www.hathitrust.org/access_use#pd-google
Digitized by Google
Original from UNIVERSITY OF MICHIGAN

The Most Interesting Job in the Yard

Previous issues of MARINE ENGINEERING AND SHIPPING AGE *have contained letters from a machinist in the engineering department, an engineer in the engineering office, an engine erector and a draftsman in the hull department—all giving substantial reasons why their particular jobs are the most interesting in the yard. This month these claims are disputed by a ship joiner. How about YOUR job? Tell us about it.*

AS a ship joiner, who served his apprenticeship in the shop, on the ship and in the drawing room, I would like to tell about the most interesting job in the yard —ship joinery. What could be more interesting than taking the rough lumber and fashioning it into beautiful and comfortable furniture for dining saloons, smoking rooms, staterooms, etc., for the passengers and at the same time turning the cold ship into a *home* for the men who "go down to the sea in ships?" There is so much to joiner work that I will briefly outline but a few things.

Starting first in the joiner shop drawing room (it may seem odd but joiners are proud of their draftsmen and consider them always as joiners), let us assume that the yard has a large passenger ship to build. The draftsman receives a plan of the arrangement of quarters, the specifications and all necessary reference plans, such as plans of steel deck houses, casings, bulkheads, shell plating, framing, decks, transverses, stanchions, heating and sanitary systems, fire mains, ventilation, sounding pipes and electrical plans.

IN THE JOINER SHOP DRAFTING ROOM

As an example, let us take a public room, say the smoking room, and draw the deck plan of the ship to scale, say three-quarters of an inch to the foot. After we have laid down the center line and outlined the steel bulkheads and casings around this room, we spot the stiffeners and figure on fastening our furring. Then we can indicate the tongued and grooved lining and decide on the size of the room, face to face of the lining.

We next work up the different sections through the room to find interferences, such as brackets, girders, pipes, etc. Then the design of the room is laid down, always bearing in mind to work in with all piping and ventilator systems, and the electrical wiring, etc. We work the cornice over the steel brackets, unless the brackets are too large and spoil the design. In that case we get the hull men to cut the brackets out on a curve, which does not impair the strength, and also makes a better job of the joiner work.

The girders we case in, bearing in mind that all steel work must be covered so that a person on coming into the finished room sees everything in line and symmetrical. The windows, likewise, will have to be located to suit the joiner work. We always work as near to the steel plans as we can; then fight with the hull drawing room to have a stiffener shifted, if necessary (on the plan, never on the ship).

Now we are started and each section of panel work, the columns, cornice, beams and girder casings, moldings, tongue and groove, furring, window and door trim, sash, screen, blinds, doors and furniture are detailed, each on a separate sketch and sent through the shop to be manufactured.

These sketches first go to the shop leader, who lists all material, and then the lists go to the cut-out sawyer, who cuts out all material in the rough, then to the jointer, planer, sticker or lathe, according to the operation to be performed, then to the layer out, who lays out the lumber for mortising, tenoning, ploughing, rabbeting, fluting or carving, or to be glued up, then to the various machines, then to the sander or scraper, then to a bench hand to be assembled, hand sanded and scraped, then to the hardwood finisher or painter for the finishing. Finally, the hardware is installed in place, if called for.

Now the finished material is ready for the ship. We go out on the ship with steel tape, chalk line and camber board —checking up the steel so as to get the joiner work installed *exactly*. We find that the room is about 1½ inches smaller in length than the steel plans called for—the deck has sagged in places. Now we have to use our heads for the finished room must be correct, so we take up (steal, the joiners say) a little here and a little there until the panel work, cornice, etc., line up so fair that even the old time joiner inspector, who squints one eye and swears he can see anything fifty feet away that is out of line one-sixteenth of an inch, passes the room as O. K.

THE WORK ON THE SHIP

The room is now shaping up and beginning to look good. You have a force of say twenty joiners in this room. You know what every man is capable of doing and what particular work he can best perform. The old joiners are expert in all the work, and so are some of the young ones, who served their apprenticeship before the war. You put Bill at fairing up the cornice, Joe at hanging doors and Tom at fitting sash and screens. You notice with pride how neat and efficient they are at work, how Bill never hits the moldings without using a block, how careful Joe is that he does not split out the wood when he cuts out for the lock and hinges and how particular he is that the slots in the screw heads line up so they will not annoy the eye of a good joiner when he sees them. And there is Tom just taking enough off the sash or blinds so they will not rattle and annoy the passengers and at the same time give them enough clearance so they will work. Every piece of wood seems to have life. The men take pride in their work. They would sooner lose a finger than have it said their work was not right. It is the most interesting job!

THE CRITICS ARRIVE

It is noon. The men sit down and eat their lunch right on the job. Between bites they glance around the room to see if their work looks perfect from other points of view. The crowd starts in to see the joiner work—a couple of draftsmen or clerks from the main office, here a riveter, there a bolter or driller, a few machinists and plumbers, a ship carpenter and electrician. It is interesting how it draws all of them.

You slip away to make up your time book and meet the other foremen and you just have to say what a good joiner Low is or Charlie is.

(And Mr. Editor, if this article is printed, it will be the first time to my knowledge that any article about "Ship Joinery" was printed, as ship joiners, for some reason, will never write anything about their trade. It is a secret art. During the war, thousands of men worked at ship joinery and now they think they are joiners—but it takes the "old timers" to build an elliptical front paneled pilot or deck house, and to develop the sills and plates, moldings, paneling, sash, etc., where they have camber, sheer, rake and a radius all running together, or to build the fancy wooden skylights, etc., they used to build.) I trust that the old joiners will forgive me for writing this—but let us hope that this will wake "'em" up, so they can mark time with the iron trades and finally pull ahead.

JAMES T. STRAHAN.

West Collingswood, N. J.

Generated on 2024-09-12 11:25 GMT / https://hdl.handle.net/2027/mdp.39015080127403
Public Domain, Google-digitized / http://www.hathitrust.org/access_use#pd-google
Digitized by Google
Original from UNIVERSITY OF MICHIGAN

Ferryboats Can Be Operated On More Economic Basis

Outline of Method and Sketch of Arrangement of Machinery for Eliminating Waste on Double Ended Boats

By H. Schreck

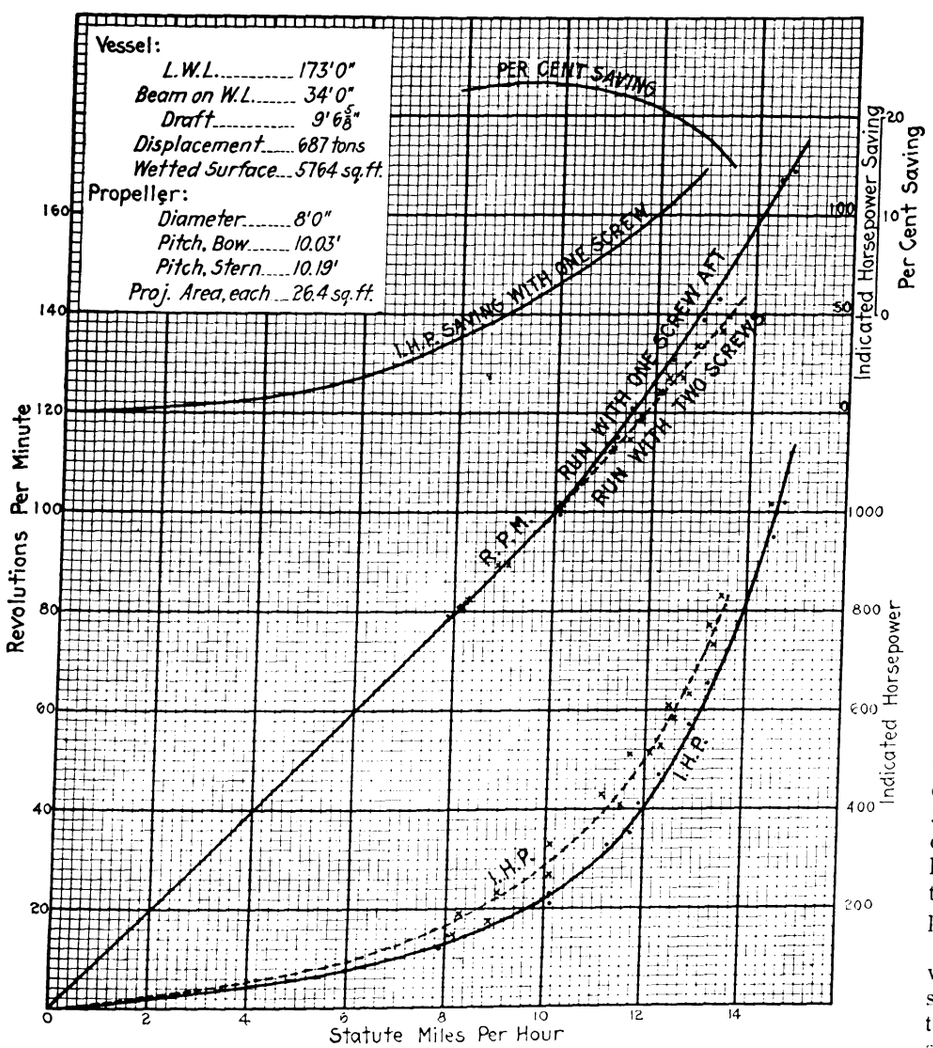
THE uneconomical propulsion of double ended boats led the writer to make a careful study of this condition, which finally resulted in a device which will eliminate the waste of power encountered on the present day arrangement of these boats. This problem has for years been a subject of calculations and tests in order to establish the amount of said waste of power.

This type of boat is in general laid out with one triple expansion engine or two compound engines in tandem arrangement in the middle body of the boat. The shaft runs to each end of the boat and carries one propeller at each end; one of these propellers pushing the vessel ahead and the other pulling the boat. When the boat is reversed the engine is reversed and in turn also the respective working of these two propellers. Some boats are driven by two through shafts in which case the above described plant is simply duplicated.

It is well known that the low propulsive efficiency of these boats is due to the dragging of the forward screw and to the hydrostatic pressure of the water column, which the forward screw builds up on the bow and on a great part of the forward length of the hull. It is readily seen that in this manner a large part of the energy which is put into the forward screw is very largely lost and the output of the engine must be increased by the amount of said increased resistance of the boat in comparison to an ordinary ship with one screw aft.

Tests

The experiments and calculations, to which reference was made in the introductory paragraph, have been carried on in an elaborate and painstaking manner on many existing ferryboats by prominent engineers for the past twenty years, and the studies by such men as F. L. DuBosque, Col. E. A. Stevens, Commander S. M. Robinson and others will remain of permanent value to the marine engineer.



Results of Progressive Trials of Ferryboat Edgewater

Line — and points designate I. H. P. when boat is driven by screw astern only.
Line - - - and crosses designate I. H. P. when boat is driven by screw ahead and astern.

In the accompanying chart the results of the progressive trials of the *Edgewater* were plotted from the test sheets, which were made and published by Col. Stevens in 1902 in the Transactions of the Society of Naval Architects and Marine Engineers. These tests were run in three ways: first, with both screws in place, one forward and one aft; second, the forward screw removed, the boat being pushed only by the aft screw; and third, the aft screw removed, the boat being pulled by the forward screw. The latter results are not plotted in the chart on account of the extreme losses and because they are of no commercial value.

Although this chart hardly needs any explanation, it may be shown by one example how to read the chart. Assuming the boat is to run twelve miles an hour, we follow the twelve-mile line and find that at this speed the vessel requires, when driven by two screws, 502 indicated horsepower and driven by one screw 400 indicated horsepower, which would mean for the latter case a saving of 20.3 percent.

These losses or waste of energy will, of course, vary on various ships with the shape and speed of the vessel and location of the screws in relation to the hull and the characteristics of the propeller. A few other results may be quoted as follows:

Generated on 2024-09-12 11:22 GMT / https://hdl.handle.net/2027/mdp.39015080127403
Public Domain, Google-digitized / http://www.hathitrust.org/access_use#pd-google
Digitized by Google
Original from UNIVERSITY OF MICHIGAN

On the *Cincinnati,* of the Pennsylvania Railroad, the loss of power due to the forward screw at eleven miles speed was measured to be 20 percent. The results of another ferryboat were published in the December, 1920, issue of this paper. At a speed of 12.75 knots an increase was required in effective horsepower, due to the forward screw, of 37 percent and an increase of total indicated horsepower of 23 percent. In the May, 1921, issue of *Pacific Marine Review,* the tests of a large ferryboat on the Pacific Coast were published. This boat required at a speed of 14.77 knots, with both wheels, 3,010 indicated horsepower, and with the forward wheel taken off 1,740 indicated horsepower, which represents in the latter case a saving of 42 percent.

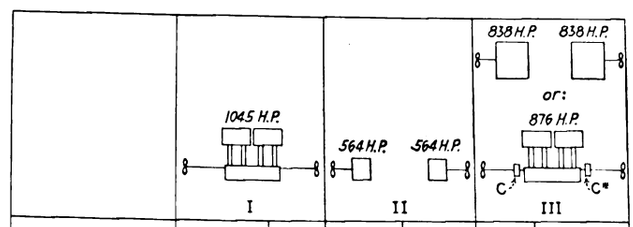
Suggestions have been made and followed out to overcome this waste by using a propeller without backing power. Propellers which embody this demand, as much as possible, are running on some ferryboats. It is claimed, however, that the maneuvering of the boat is very unsatisfactory.

Trend of Eliminating this Waste

There are three characteristic methods of propulsion of double ended ferryboats and in illustration some of the figures of a previously mentioned publication by Commander Robinson will be utilized.

If we consider his boat of 191 feet length, 44 feet beam, and running at a speed of 10 knots, the total towing power with two screws of 680 effective horsepower and with only the after screw 496 effective horsepower the following three arrangements may be investigated for this boat:

1. The present day arrangement, that is, one main engine.
2. Two motors, each transmitting about half of the power. However, each one can be turned at its respective most favorable speed.
3. Two motors, one at a time transmitting the full power for pushing the boat, while the other motor turns the screw over at about the speed of the boat, but without doing any work. This condition is reversed for running the boat in the other direction.



	I		II		III	
Screw	Aft	For'd	Aft	For'd	Aft	For'd
R.P.M.	116.9		114.7	119.8	131	117
I. H.P.	656	389	564	460	838	38
I.H.P. Total	1045		1024		876	
Gain over I					16%	
Gain over II					14.5%	

* Clutch

It can be readily seen that the gain of case 2 over 1 is very little, which is evident from the fact that in case 2 the forward propeller still throws the column of water against the bow of the vessel. A marked gain in propulsive efficiency is, however, made in case 3, in which the forward propeller does no work, but is merely turned over. The turning will require only about 4 percent of the power, as it is only necessary to overcome the frictional resistance of the propeller blades and of the shafting.

This arrangement is, as to propulsive economy, practically equal to an ordinary ship with the screw aft. The first cost is, of course, very much higher since it requires two full power motors and in addition a generating set, and the overall efficiency is lowered by 15 to 18 percent of the power due to the electric transmission by generator and motor.

A part of this electric loss is offset by the fact that the generator set can be a high speed turbine, which works more efficiently than the reciprocating steam engine. With this arrangement Diesel engine generator sets would produce far greater substantial saving.

Suggestion of the Writer

In order to accomplish the maximum propulsive efficiency, the writer suggests an arrangement which will combine the advantages of cases 1 and 3 at the smallest cost of installation and the possibility of building it in on existing boats (a patent on this combination is pending).

The suggestion is to interpose a clutch at each end of the main propelling unit between same and the two propeller shafts. This clutch, which may be a magnetic or hydraulic one, will allow varying the power transmitted and the speed of the after shaft in relation to the forward shaft; that is, when the boat is going ahead almost the full power of the main engine will be transmitted to the aft screw, while the forward screw will be merely turned over at about the speed of the boat, but without doing any propulsive work. Clutches that fulfill the above requirements have been investigated and are being built.

Expected Savings

An example may be cited which will allow the reader to form a conception of the savings which can be effected by providing a ferryboat with the suggested improvement. Taking, for instance, a ferryboat of 1,400 indicated horsepower, the following results may be obtained:

Thirty percent saving in propelling power = 420 indicated horsepower. Assuming the boat to run 10 hours a day for 300 days of the year. Take the cost of coal at $9 per ton and the coal consumption, including auxiliaries, at 2 pounds per indicated horsepower.

$$\frac{420 \times 2 \times 10 \times 300 \times \$9}{2{,}240} = \$10{,}120$$

Reduced cost in handling of coal and reduced boiler repair bill, estimated 3,500

Saving per year..... $13,620

It will be noticed, that the estimates are made very conservatively. The saving of 30 percent is taken as an average of actual tests. Also 10 hours' operation is very little, since most ferries run for 14 to 16 hours and some of them for 24 hours. Very conservative also is the figure of 2 pounds of coal per indicated horsepower for compound engines, but the writer has tried to make all his statements as carefully as possible.

National Foreign Trade Council Urges Adoption of Hague Rules

American shipowners and operators are urged by the National Foreign Trade Council to issue, as soon as possible, bills of lading drawn in conformity with the Hague Rules, 1921. The following statement represents the views of the executive committee of the council, of which Mr. James A. Farrell, president of the United States Steel Corporation, is chairman.

"The committee believes that these rules embody as favorable a readjustment of the distribution of liability between shipper and carrier, as can at present be secured. While fully cognizant that these rules do not satisfy many of the demands of shippers, the committee is of the belief that their adoption will constitute a substantial step in the right direction and will, in fact, confer very real benefit on the foreign trade of the United States."

Generated on 2024-09-12 11:24 GMT / https://hdl.handle.net/2027/mdp.39015080127403
Public Domain, Google-digitized / http://www.hathitrust.org/access_use#pd-google
Digitized by Google
Original from UNIVERSITY OF MICHIGAN

Deck Coverings

By Horace Holden Thayer*

Continuation of a series of articles containing information regarding shipbuilding materials and their uses that is not readily obtainable from shipbuilding handbooks and other generally available sources. The articles are not intended to be a complete exposition of the subject but will be found to contain items of value to the various classes of workers in this field who have to deal with these materials from the materials point of view.

THIS article is concerned with special forms of deck covering that are frequently met with. It is not concerned with the usual run of wood decks, canvas, paint, or those bituminous coatings whose principal purpose is to act as a preventive of corrosion. As a number of the deck coverings are put forth under trade names which do not clearly define their character, such names of American products as the writer has come in contact with will be presented in order that the reader may be advised as to what class of product they belong. No attempt will be made to compare proprietary coverings of the same nature with one another.

Ship specifications generally state the types of deck covering that are to be used in various locations, but there are usually a variety of points to be considered before the specific covering is finally determined upon. In making these determinations classification society requirements should not be overlooked.

The principal points to be considered in the selection of deck coverings are below listed, and the type determined upon for any location should be the one which is best in those features that are of most importance for that particular service and for the main governing circumstances. The preparation of a typical schedule of general application is impossible.

Weight
General durability
Appearance
Wearing qualities
Resiliency
Waterproof and sanitary properties
Non-slippery
Quietness
Warmth
Cleanliness
Fireproof
Probability of failure
Cost

In laying deck covering it can be stated as a general requirement that the deck should be absolutely dry and clean, and free from scale, oil or other foreign matter.

ALUNDUM TILE

See "Tile" Class (b). This tile is particularly slip proof.

ASBESTOLITH

See "Composition."

BEAVER TILE

See "Cork Composition Tiling."

BITUCRETE

See "Bitumen Deck Coverings" Class (c).

BITUMEN DECK COVERINGS

These are heavy coverings for hard usage such as the truck ways of ferryboats or on troopships. The material is also of value for the bottom of chain lockers. They are of four general classes and various special types all of which have asphalt as the binder. Asphalt is a black bituminous hydrocarbon, semi-fluid to hard in consistency, which is the heavy residuum from some petroleums or occurs naturally. As made up for use it is usually called asphalt cement. The four usual classes of covering are:

(a) What is commonly known as asphalt, which is a mixture of native or prepared asphalt cement and stone dust.
(b) The same as (a) but with larger stone, slag, coke or other aggregate in it.
(c) A covering made by coating the deck with the pure asphalt cement and then laying down a layer of hot stone which draws the asphalt up through it.
(d) A covering made by the use of cork bricks, bituminous bricks or other material of that nature laid in the standard bituminous solution and enamel coating and with the enamel poured between the cracks and over the top, and the top sanded.

In all four cases the deck should be first coated with a bituminous paint as a binder, and with class (c) a 2-inch mesh wire fabric welded to the deck is desirable.

Class (a) is laid hot, sanded on top and rolled or tamped, then the excess of sand is brushed off, Portland cement is sprinkled over the surface, and it is again rolled or tamped. The composition is usually about—

Asphalt cement	10	percent
Stone passing 200 mesh	13	percent
Stone passing 80 mesh	23	percent
Stone passing 40 mesh	27½	percent
Stone passing 10 mesh	26½	percent
	100	percent

It weighs about 102.5 pounds per square yard per inch of thickness.

It can also be laid upon a bottom course containing still less asphalt and with stone up to one mesh in size, or can be laid on a backing of other material.

Class (b) material is also laid hot but some of the mixtures do not require rolling. It can be made lighter than class (a) by using coke or other light aggregate. The stone in class (c) is usually small, up to ⅛ inch and the coating is rolled.

Bitumen deck coverings demand an asphalt cement of high melting point, ductility and cementing power and low penetration, the latter being a measure of the distance a weighted needle will sink into it during a specified time at a specified temperature. It also demands skilful mixing and laying. If not of proper quality and well laid, it is subject to cracking and pulling away from bounding angles, etc., to disintegration, scaling and very easy marking and displacement. It is always subject to cracking when not in constant use because there is a gradual passing off of volatile matter which results in the materials soon becoming dead unless the surface is kept alive by the traffic over it.

An asphalt deck covering was developed by the Concrete Ship Section of the Emergency Fleet Corporation which called for the use of an asphalt cement having a melting point from 104 to 140 degrees Fahrenheit, a penetration of 80 to 90 at 77 degrees Fahrenheit, 100 grams, 5 seconds, and which did not specify the ductility. The covering was made from this asphalt and stone particles 100 percent of

*Member of the firm of Rossell & Thayer, naval architects and marine engineers, Philadelphia, Pa.

Generated on 2024-09-12 11:25 GMT / https://hdl.handle.net/2027/mdp.39015080127403
Public Domain, Google-digitized / http://www.hathitrust.org/access_use#pd-google
Digitized by Google
Original from UNIVERSITY OF MICHIGAN

which would pass a ¼ inch sieve and not over 5 percent of which would pass a 100 mesh sieve. It was found to be too soft and the specifications were revised to call for an asphalt having a melting point from 135 to 150 degrees Fahrenheit, a penetration of 40 to 60 and a ductility of not less than 20 centimeters. The sand was as before and a mineral filler was called for of any fine material such as Portland cement, limestone dust or silica, 85 percent of which would pass a 100 mesh screen. The requirements with regard to mixing and application were:

Formula for mixing—Asphalt cement—10 to 15 percent
Mineral filler 20 percent
Sand or other aggregate 70 to 65 percent

The sand or the mixture of the sand and mineral filler and the asphalt cement shall be heated separately to about 300 degrees Fahrenheit and when the aggregate is dry and the asphalt cement completely fluid, they shall be thoroughly mixed. If limestone dust is used, it shall be mixed cold with the hot sand just before incorporating it with the asphalt cement.

The hot mixture prepared as above shall be spread on the deck previously coated with a priming coat which has become tacky and shall be smoothed out with suitable hot iron and rolled. Before rolling, the surface should be sprinkled with Portland cement or limestone dust.

The properties of natural asphalts and typical asphalts from Mexican and Californian crude oils are of interest in this connection. Pennsylvania crude is a paraffin base oil and cannot be made to produce asphalt.

	Natural		Oil	
	Trinidad	Bermudez	Mexican	Californian
Bitumen, percent	56.0	94.	99.5	99.5
Mineral matter, percent	36.8	2.	.3	.3
Melting point, degrees F.	190	180	140	140
Penetration	.5	2.5	55	40
Ductility			45 cm.	2 cm.

The natural asphalts are considered to be the best. They can be modified to have any desired penetration, with corresponding change in the other properties. In some cases the melting point of oil asphalts is raised and the penetration lowered by blowing air through them during manufacture but this is at the expense of ductility and cementing power, and such asphalts are of no value for flooring purposes.

BREYLITE

See "Bitumen Deck Coverings." Class (b). This coating with a stone or slag filler weighs about 27 pounds per square foot, 2½ inches thick.

BRICK

The use of brick as deck covering is confined principally to the galley, oven rooms, etc., and red pressed bricks are most favored. They are laid on Portland cement thick enough to take care of all irregularities and also to have sufficient body in itself to keep from breaking up.

BRICK TILE

Brick tile are used where bricks are used, and also in pantries, bar rooms and other locations where frequent washing is desirable and where bricks are not quite good enough.

Their wearing qualities are shown in the comparative table in the section on "Composition."

They should be laid in Portland cement, a 1 to 2 mix, about 1½ inches thick, and grouted with Portland cement grout.

CEMENT DECK COVERING

This is a mixture of Portland cement and sand and as a complete covering is of principal value in crews' washrooms and toilets, laundries, sculleries, storerooms and similar service.

The surface under wear produces a fine powder. Surface waterproofing compounds can be used to harden the surface and reduce this trouble, but are not required for the usual shipboard service of this covering.

As will be seen from the wear resistance table in the section on "Composition" a mixture of one part cement and one part sand is most desirable. When used in connection with a surface covering of some material a mixture of one part cement to two parts of sand will usually answer. The Navy Department requires a 1 to 1 mix under tiling.

This deck covering weighs about 12⅔ pounds per square foot per inch of thickness.

COMPOSITION

A deck covering which is essentially a magnesium oxychloride cement is designated as a composition deck covering. It is one of the best and, therefore, extensively used.

The most valuable features of a composition deck covering are that it is durable, sanitary and vermin proof, free from splintering and from the sanding out that is frequent with Portland cement, allows of good color effects and beauty of finish, and is non-slippery. This material is also of relatively light weight and is watertight when in good condition. It is comparatively noiseless to the tread and quite efficient as a thermal insulator.

The chief disadvantage of a composition deck covering as developed to date is that it does not retain its strength and soundness when subjected to continued wetting, that it cracks when subjected to the excessive heat sometimes found above boiler rooms and other heated spaces, that, if there is any excess of magnesium chloride in it and water penetration between it and the steel deck, rapid corrosion of the steel will result, and that it does not bond firmly to smooth steel plates. For these reasons one of the classification societies during the height of the wartime shipbuilding activities sent out the following excerpt from their published rules to deck covering manufacturers:

"Deck Composition may be laid on steel decks which are not exposed to weather, excessive moisture or heat, provided the material is not destructive to steel or is effectively insulated from the steel by a non-corrosive protective covering, which is proof against attack by chlorides. Samples taken from the composition by the surveyors, while it is being laid, are to be subject to independent analysis at the cost of the manufacturers. The steel plating is to be thoroughly cleaned with alkaline solution before composition is laid. Large areas of deck are to be divided by cabin sills, angles, etc., or holdfasts are to be fitted not more than 3 feet apart."

Roughing up the steel deck or curling up chips of it, with air tools, is allowed by the classification societies in lieu of the above mentioned holdfasts, but the latter have much to commend them. The non-corrosive protective covering referred to, which is generally recommended by classification societies, consists preferably of two coats of a bituminous solution that will permanently adhere to the steel deck without cracking. With some makes of composition this covering is definitely required. In locations where the composition would be exposed to excessive heat, if laid in the usual way, it can be used with safety by the interposition of a layer of cork slabs between it and the steel, the steel first being coated with the above mentioned bituminous covering. It is held down by properly placed holdfasts extending above the cork.

On wood decks the practice is to lay down heavy insulating paper over which expanded metal or heavy galvanized poultry wire is securely nailed. The composition is then applied.

RELIABILITY OF MANUFACTURER IMPORTANT

The writer is of the opinion that the best specifications for composition deck covering which can be devised will not safeguard the shipbuilder and owner like *the selection of a manufacturer whose product has been proved to be good*

Generated on 2024-09-12 11:23 GMT / https://hdl.handle.net/2027/mdp.39015080127403
Public Domain, Google-digitized / http://www.hathitrust.org/access_use#pd-google
Digitized by Google
Original from UNIVERSITY OF MICHIGAN

and who has a reputation to maintain. A selection of the material on a competitive price basis alone, under such specifications as are usually met with, is suicidal. This may be readily seen by those who are sufficiently interested to follow along with the discussion of this material, which includes many of the findings and the conclusions derived therefrom of the Dow Chemical Company of Midland, Mich., which has done a vast amount of very valuable research work on this product for use both as stucco and as floor covering.

True magnesium oxychloride cement without the special ingredients required for floors consists of:

Aggregate, which is usually "silex" or powdered silica, crushed from quartz and consisting almost entirely of sharp and irregularly shaped particles.
Sand, relatively fine.
Calcined magnesite, powdered.
Magnesium chloride solution.

The aggregate, sand and magnesite are first mixed together in the proper proportions and then sufficient magnesium chloride is added to produce a material of the right consistency. This combines with the magnesite to form magnesium oxychloride which then acts in the same manner as Portland cement acts in Portland cement concrete. Magnesium chloride may be dissolved in water to form a solution of any strength from zero to 36 degrees Baumé, at which point the solution is practically saturated at 70 degrees Fahrenheit. At this temperature one gallon of 22 degree solution will contain approximately 4½ pounds, and one liter will contain approximately 530 grams of solid fused chloride. It is not safe, however, to depend upon any weight-volume ratio when making up a solution; it should be tested with a hydrometer that is accurate and easily read. The Dow Chemical Company has adopted a method of determining consistency by use of a series of flat ended rods of equal weight but of widely varying diameter which are applied to the surface of the deck covering immediately after mixing. Standard consistency is set by them at the point where a No. 20 rod (250-gram, 1¼-inch diameter) just fails to enter the product. This closely duplicates the consistency of the best deck covering practice.

The silex is what is known as a 120 mesh silex (95 percent to 100 percent passing a 120-mesh screen), and one sample tested by the Dow Company and considered by it to come very close to meeting the theoretical and practical requirements of the average sand to which it is to be added as a void filler had 54 percent passing a 200-mesh screen, another 41 percent passing a 120-mesh, and the remaining 5 percent passing an 80-mesh. If the silex or other aggregate is too fine difficulties will be encountered as will be seen later.

According to the Dow Company the ideal sand is one of which one-third will pass an 80-mesh screen but be retained on a 120-mesh, another third will pass a 40-mesh, and the balance will pass a 20-mesh; or one of which one-fourth will pass an 80-mesh screen and be retained on a 120-mesh, another fourth pass a 40-mesh, another fourth pass a 20-mesh, and the balance pass a 10-mesh. A commercial sand 90 percent of which passes a 20-mesh screen may be expected to be of about the proper fineness.

Composition of Magnesites

The composition of commercial magnesites varies within wide limits. The Dow Company gives the following as the average of a large number of commercial magnesites tested by it in 1919 and states also that it believes this to represent a satisfactory grade as far as chemical composition is concerned. To total up 100 percent the quantities will have to be all slightly reduced.

Ignition loss	5.0 percent
Silica	6.0 percent
Iron and aluminum oxides	1.0 percent
Calcium oxide	3.5 percent
Carbon dioxide	2.5 percent
Magnesium oxide	84.5 percent

It is necessary that the magnesite be properly calcined and not under burned or over burned.

The average fineness of commercial magnesite is about as follows:

Passing 100 mesh	95 percent
Passing 150 mesh	86 percent
Passing 200 mesh	76 percent
Passing 275 mesh	42 percent

Chemical analysis is an entirely satisfactory guide to the quality of magnesium chloride and definite specifications for it can be written on the basis of chemical analysis alone. The Dow Company advertises its magnesium chloride as averaging less than one percent of salt and of calcium chloride and containing only a trace of sulphate. The 22-degree solution has been taken by the company as the standard for use in oxychloride cements, as it has found that the mechanical strength, water resistance, abrasion resistance and all related factors are dangerously affected by the use of weaker solutions, that most good magnesites are thrown into the doubtful class and medium or poor magnesites are worthless when used with 18-degree solutions, and that trowelling troubles should be eliminated by the use of a slower setting magnesite instead of uselessly trying to patch up bad properties with the use of lower solution strengths, reserving the rapid setting magnesites for use in cool weather. They have found that solutions of 24 or 26 degrees Baumé may be recommended for use with magnesites which do not have marked expansive characteristics and which are velvety instead of sandy in texture and that while sandy textured magnesites produce products which are prone to sweating and efflorescence when made up with 26-degree or stronger solutions, the use of 22-degree or 18-degree solution is not a secure protection from these undesirable properties in their case.

Other Ingredients

With most of the ingredients outside of the magnesite and the magnesium chloride the physical properties are of much greater importance than the chemical composition.

While a true magnesium oxychloride cement of the mixture before given is very good for stucco it will not answer for deck covering on account of the demand for resilient treading, hardness, a fine finished appearance, color, etc.

Nearly all deck covering compositions contain 8 to 10 percent of color pigment, about the same amount of powdered talc, or soapstone, the latter being an aid to trowelling, and a like amount of fibrous binder filler. The amount of silex added depends upon the degree of hardness and wearing resistance desired, the larger amounts giving the harder floors. A floor of average hardness would contain about 25 percent of silex, which gives a total of about 55 percent of fine aggregate, silex, talc fiber and pigment. The calcined magnesite is usually at least 45 percent, which is much in excess of the amount necessary to fill the voids in the fine aggregate but desirable for fine finished appearance and resilient treading. The amount of fiber present is small in weight but relatively large in bulk. It is mineral or ligneous. The mineral fiber, asbestos, may be obtained in various lengths or grades, each of which finds preference by one or another of the deck covering manufacturers. The wood fibers are used either as sawdust or as pulverized wood flour of varying degrees of fineness.

The principal requirements of a composition deck covering are:

1. Strength
2. Good wearing qualities
3. Freedom from excessive expansion and contraction
4. Watertightness
5. A setting time that will allow of proper handling
6. Permanency and uniformity of color
7. Freedom from excessive sweating and efflorescence

Generated on 2024-09-12 11:22 GMT / https://hdl.handle.net/2027/mdp.39015080127403
Public Domain, Google-digitized / http://www.hathitrust.org/access_use#pd-google
Digitized by Google
Original from UNIVERSITY OF MICHIGAN

8. Good surfacing qualities
9. Sufficient thickness of coating

Most of these requirements demand properly calcined magnesite of suitable analysis, pure magnesium chloride and good materials throughout, uniform mixing and skilful laying; but there are a number of factors which particularly affect the different properties, that illustrate what a complex problem the manufacturer of composition deck coverings has on his hands, and which we will now consider under the respective headings.

Strength

Good strength is an indication of good magnesite quality. The tensile strength of deck covering composition should be at least 500 pounds per square inch when seven days old. The compressive strength will be about four times the tensile strength. The modulus of elasticity of the average deck coverings on the market is in the neighborhood of 1,000,000, and this allows of a contraction of about .05 percent before reaching a stress of 500 pounds per square inch.

Tensile, compressive and cross bending strength tests are all important. The compressive test is more reliable than the tensile with high strength materials on account of the difficulty in securing uniform stress when testing briquettes. The cross bending test is closer to operating conditions than the straight tension and compression tests, and allows of the determining of the elastic properties of the material in comparatively simple fashion. On account of trowelling, the structure of the surface is different from that of the material beneath it; and this has led to the development by the Dow Company of a special type of test bars, approximating the structure of the material as actually used, which are tested by this method.

Proper grading, which is principally a matter of void filling, is a strength factor. There should be no large voids as the magnesium oxychloride binder, like glue, is of maximum value only when in a thin film. The sand used should be clean and pure, and free from organic matter and mud.

As previously stated the magnesium chloride solution should be 22 degrees Baumé or higher. A solution of any strength between 14 degrees and zero does not produce a true cement, a 16-degree solution is but little better, and an 18-degree solution gives only 50 percent of the strength that the deck covering can attain with use of a 22-degree solution. There is a steady but less rapid increase in strength of the covering with increase in strength of the solution above 22 degrees. Notwithstanding this fact some contractors allow the use of weak solutions under the impression that a degree or two makes no difference, leaving the matter in the hands of ignorant or incompetent workmen equipped with inaccurate hydrometers or those that are difficult to read. There is also a temptation to stretch out an insufficient supply of solution by adding water to it. Specifications and working directions should call for the use of at least 22-degree solution. By using stronger solutions less magnesite will be required for any given strength of the resultant product; and the actual volume of solution needed to produce a given stiffness of mix decreases steadily with increase of chloride solution strength.

Excessive amounts of chloride solution reduce the strength, although wet mixes show somewhat higher strength after being wet and dried again than those of normal consistency. This last is fortunate as the tendency, to make the work easier, is to apply the material in a condition wetter than it should be.

The use of an aggregate of impalpable fineness such as Kieselguhr results in inferior strength.

Wetting decreases the strength and a mix which gives high strength when tested dry may lose all of its strength on being wet, while another originally weaker will stand up better. Some workers with this material feel that the use of 18-degree chloride results in a superior product as regards water resistance to that when 22-degree chloride is used but tests made by the Dow Chemical Company show the contrary to be the case. These tests, however, have led them to the conclusion that the water resistance, or the strength after having been subjected to wetting, of any particular oxychloride cement will be found to be a function of the amount of chloride used.

Furthermore compositions produced by some magnesites, which stand at the top of the list as regards strength when dry, are much inferior when wet to those produced by other magnesites which give decidedly less dry strength to the product. It is essential that the deck covering manufacturers study the water resisting properties of the magnesites they purchase, for some of them give cements so little resistant to water that trouble is almost sure to result from their use. The Dow Company believes that the cause of the variation lies more in the burning than in the chemical composition of the magnesite. Commercial products can be secured which give cements of very high water resistance, and a study of this one point will greatly lower the chance of failure of composition deck coverings as well as possibly opening the way to a wider field of usefulness.

Wearing Qualities

A composition deck covering should have good abrasion resistance as well as good wearing resistance. The former has to do only with the scratching or marring of the actual surface but depends upon the same factors that affect the wear, with possibly an accentuated effect of the trowelling. Abrasion resistance is also increased by the use of a highly fibrous base or scratch coat, which increases the resiliency of the product. A uniform covering throughout is much to be preferred, however, if working conditions about the ship are going to delay the application of the finish coat of a two-layer job so long that it cannot make a proper bond with the scratch coat, or if the other work being carried on results in getting oil, grease and similar materials on the scratch coat.

The majority of composition deck coverings are designed for resiliency, easy treading and highly finished surfacing qualities; some are made harder with resultant loss in resiliency; and for the maximum amount of wearing resistance there is the oxychloride artificial stone flooring. If woodwork has to be screwed to the composition, it must be made relatively soft, and this can be accomplished without making the material porous.

On account of the impractibility of selecting any one of the types of oxychloride flooring as a standard of wearing resistance for comparison with other coverings, the Dow Chemical Company selected clear, well seasoned maple flooring for this purpose, it being more uniform in its properties than any other readily available flooring. Rating this at 100 they found by careful test the following relative immunity-to-wearing values:

Oxychloride heavy duty flooring (average of 8 prepared samples)	414
Hard white porcelain tile (mosaic)	233
Common red tile (hard, unglazed)	164
Inlaid linoleum (best grade)	147
Inlaid linoleum (medium grade)	113
Semi-hard oxychloride flooring (average of 4 submitted samples)	103
Hard maple flooring	100
White oak flooring	88
Asphalt mastic	73
Hard yellow pine flooring	63
Oxychloride composition flooring (resilient type)	
Average of seven submitted samples	51
Average of ten prepared samples	47
Portland cement (1:1 mix)	43
White marble slab	28
Alberene stone	16
Portland cement (1:2 mix)	14
Portland cement (1:3 mix)	11
Printed linoleums	1 to 10

Generated on 2024-09-12 11:20 GMT / https://hdl.handle.net/2027/mdp.39015080127403
Public Domain, Google-digitized / http://www.hathitrust.org/access_use#pd-google
Digitized by Google
Original from UNIVERSITY OF MICHIGAN

The prepared samples of composition were of a flooring mix which closely approximates the average properties of the usual commercial composition deck covering. They were made with magnesites of normal setting time and tested at fourteen days' age.

There is no dependable relation between wearing resistance and tensile strength. It would therefore seem advisable for deck covering manufacturers to add a comparative wearing test of some kind to the other physical tests they make of their product.

The wearing resistance of the average deck covering is roughly proportional to the amount of magnesite in the mix. It is therefore dangerous to lower the magnesite content for the purpose of economy. Compositions designed for hardness rather than for resiliency may, however, have much greater wearing resistance than the average deck covering notwithstanding a much lower percentage of magnesite.

Some floors are found to resist wear more than twice as well as others when the only difference in them is the particular magnesite used.

The nature of the fiber used has a bearing upon the wearing resistance. It is commonly recognized that wood fiber gives the more resilient flooring while asbestos fiber imparts the greater hardness and wearing resistance. The Dow Chemical Company has found, as averages of several tests of each kind of fiber in the standard flooring mix, the following interesting effect of fiber variation:

	Relative Immunity with Hard Maple Flooring as 100
Asbestos, long fiber	61
Asbestos, medium fiber	55
Asbestos, short fiber	47
White pine sawdust	50
White pine wood flour	42
Hard maple sawdust	40
Hard maple wood flour	31
Oak sawdust	45
Oak wood flour	41
California redwood sawdust	43
California redwood wood flour	38
Granulated cork	56
Cork flour	50
Hard yellow pine sawdust	43

The Dow Company considers the relatively high value of the white pine fibers as compared with the wearing resistance of white pine boards to be due to the fibers being insecurely bound in the board form. The wood flour fibers are ⅓ to 1/10 the size of the sawdust fibers, present a very much larger surface to be covered by a given amount of binder, and are thus less firmly held.

Upon investigating the effect of aggregate variation upon the wearing qualities the Dow Company ascertained the following:

Fine Aggregate	Relative Immunity with Hard Maple at 100	Tensile Strength
3 Powdered silica : 1 talc : 1 pigment	43	625
3 Powdered marble : 1 talc : 1 pigment	36	592
3 Powdered limestone : 1 talc : 1 pigment	35	606
3 Powdered Kieselguhr : 1 talc : 1 pigment	27	452
3 Powdered silica : 1 China clay : 1 pigment	65	703

This illustrates the unreliability of the tensile strength as a gage of the wearing resistance. That chemical composition is not the determining factor is also shown because Kieselguhr, or diatomaceous earth, is identical chemically with silica, both being silicon dioxide. The former, however, is much the softer. China clay shows up very well, but may have disadvantages in other directions which offset this good showing.

Solution strength is a big factor in developing a wear resistant composition deck covering. There is a very great increase in resistance to abrasion with an increase in the chloride strength from 16 degrees to 22 degrees, but little or no gain in this direction from the use of solutions above 24 degrees Baumé. A deck covering made with solution of low strength will wear three times as rapidly as one made with 22-degree solution. The greater loss in strength when wet, before referred to as a result of using weak solutions, results also in excessive wear.

Upon investigating the effect of stiffness of the mix upon the wearing qualities the Dow Company ascertained the following:

Consistency	Relative Immunity with Hard Maple as 100
No. 16 supporting 250 grams on 1 inch diameter surface	47
No. 20, supporting 250 grams on 1¼ inch diameter surface	46
No. 24, supporting 250 grams on 1½ inch diameter surface	43
No. 32, supporting 250 grams on 2 inch diameter surface	42
No. 48, supporting 250 grams on 3 inch diameter surface	37

It is evident that the tendency of inefficient workmen to mix the material too thin should be carefully guarded against.

Upon investigating the claim of the deck covering manufacturers that by a proper trowelling procedure a superior wearing product could be obtained the Dow Company ascertained the following, which amply justifies the claim:

Surface Treatment	Relative Immunity with Hard Maple as 100
1. Strike-off and immediate smoothing without any subsequent surface finishing	30
2. Strike-off, smoothing, and a moderately heavy trowelling at or about initial set	45
3. Same as (2) but with an additional heavy trowelling at about the final set	46

It appears from these figures that about 50 percent improvement in the resistance to wear is developed by the use of proper trowelling as against no surface finishing after the first smoothing; also that the second trowelling is of little or no value. Materials which set so fast that they cannot be properly trowelled and have to be finished off by rubbing with wire wool probably come in the class of the test (1) product.

The use of a properly designed machine mixer will result in increased wearing qualities as against the best hand mixing. Such use should also result in reduced labor costs.

For heavy duty service the Dow Company recommends a special mix containing silica sand when trowelled to a smooth top surface the hard silica sand grains present a very high wearing resistance and they are so firmly bound by the oxychloride cement that they are not, like the sand in most Portland cement floors, dislodged by the abrasive action of traffic. Such a mix shows an average wearing resistance four times that of hard maple and from eight to nine times that of the average composition deck covering of the resilient type. Its cost should be considerably less than the latter and be only a little above that of the best Portland cement flooring. It is questionable if this would be found to have sufficient toughness for shipboard use except in small areas; but there is a good field for a wear resistant material for spaces that are at times used for accommodations and at other times for cargo, and this may be a suggestion to that end.

(*To be continued.*)

American Shipping Service to the Philippines Adequate

THE Shipping Board has adopted a resolution certifying to the President that the American shipping service to and from the Philippines and other island possessions, with the exception of the Virgin Islands, is adequate, so that the President may issue a proclamation extending the coastwise laws to that service. As to the Virgin Islands, the board certified that the service would be adequate on 90 days' notice.

Generated on 2024-09-12 11:20 GMT / https://hdl.handle.net/2027/mdp.39015080127403
Public Domain, Google-digitized / http://www.hathitrust.org/access_use#pd-google
Digitized by Google
Original from UNIVERSITY OF MICHIGAN

Ship Control on Modern Battleships

Communication and Signal Systems Handled by the Bridge Officer When He Takes the Deck at Sea

By Lt. Comdr. Alex. M. Charlton, U. S. N.

THE activities of a modern man-of-war may be separated under two general heads, fire control and ship control. Fire control includes the entire system of directing the offensive weapons of a vessel including material, personnel, methods and organization. Ship control comprises the entire system of maneuvering the vessel, the upkeep of the hull structure and the maintenance of watertight integrity including the material, personnel and organization to obtain these objects.

The problem of handling vessels as large as our modern battleships in cruising formation requires the most accurate and rapid means of controlling the engines and steering gear possible. When it is considered that vessels cruise at a distance of five or six hundred yards from foremast to foremast the amount of open water between the stern of one vessel and the bow of the vessel astern of her seems almost negligible. To maintain accurate distance necessitates a fineness of control that would make the average merchant skipper very nervous.

Closed Type Pilot House

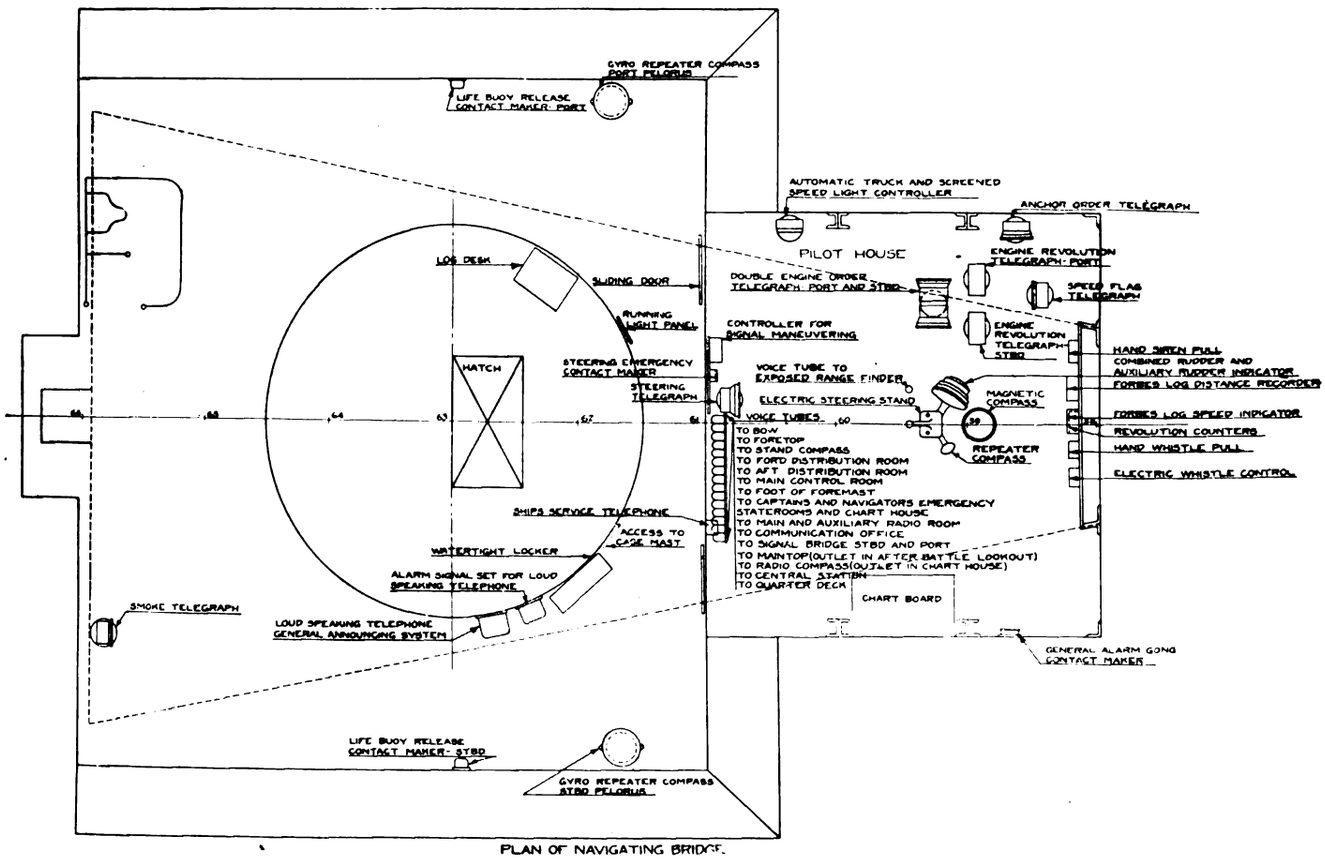
The experience of the Navy with North Atlantic weather conditions in winter led to the adoption of the pilot house type of bridge which can be completely closed in inclement weather. This in itself is a considerable advance over the old type of open bridge which caused the personnel on the bridge an untold amount of suffering in winter weather.

Steering System

Our vessels today are steered electrically, the steersman using a controller quite similar to a street-car controller. A man no longer stands a trick at the wheel, for there is no wheel. This controller operates a motor in the steering compartment which controls the movements of a hydraulic (oil) motor. Enough power is furnished to put the rudder from hard-over right to hard-over left rudder in twenty seconds. The position of the rudder at any instant is shown by the rudder indicators mounted on one side of the steering stand. One of these indicators is of an ingenious electric motor type in which a pointer is moved to the rudder angle by means of contacts made at the rudder head. The other indicator is of the lamp type in which a lamp is lighted behind the figures showing the rudder angle. The two systems are enclosed in the same case and work simultaneously, one as an auxiliary for the other.

In case the steering gear in the pilot house is broken down, a steering telegraph enables the proper directions to be sent down to the steering room at the stern of the vessel. This is a motor type telegraph.

Gyroscopic compasses determine the course of the vessel.



Plan of Navigating Bridge Showing Location of Communication and Signal Appliances

Generated on 2024-09-12 11:21 GMT / https://hdl.handle.net/2027/mdp.39015080127403
Public Domain, Google-digitized / http://www.hathitrust.org/access_use#pd-google
Digitized by Google
Original from UNIVERSITY OF MICHIGAN

The master compasses are down below armor with connections to the repeater compass mounted on the steering stand. There is also a steering magnetic compass mounted in a binnacle just forward of the steering stand.

The standard magnetic compass is mounted on a platform high up in the foremast where it will be as free from the magnetic influence of the steel of the vessel as possible.

ENGINE TELEGRAPHS

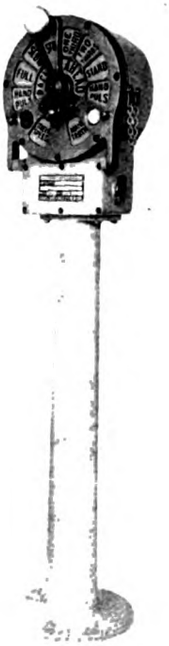
Engine order telegraphs are mounted on pedestals on the port side of the pilot house and arranged so that the transmitting handles point forward when the engines are going ahead and aft when the engines are going astern. These telegraphs are of the electric synchronous motor type and convey to the main engine control how the engines are to be moved.

Close to the engine order telegraphs are mounted the engine revolution telegraphs. These telegraphs transmit the revolutions desired at any time. They are of the motor type and will transmit revolutions by units from 0 to 299. By these telegraphs the engine room is enabled to tell the exact revolutions desired and so control the speed of the vessel to small fractions of a knot.

Rudder Indicator Motor Type

Electric Engine Order Telegraph Transmitter

Course Telegraph Transmitter Indicator



Automatic Truck and Screened Speed Light Telegraph Transmitter

When a vessel finds it necessary to change its speed in formation this information must be transmitted to the vessel astern so that she may be handled to avoid the possibility of collision. Small flags which indicate a vessel's speed in knots are displayed from the signal bridge below the pilot house level. The pilot house informs the speed flag station what the speed in knots is at any time by means of the speed flag telegraph, another motor type instrument. On the forward bulkhead of the pilot house are arranged a speed indicator and a distance recorder operated electrically from a small revolving shaft, which protrudes through the bottom at the pivoting point of the vessel. As this instrument is not connected with the propellers it gives the vessel's speed and distance run irrespective of the slip of the propellers, condition of bottom or the state of wind and sea. The indicator gives the speed in knots and the distance recorder gives the distance traveled in miles and tenths of a mile.

REVOLUTION COUNTER

Alongside of the speed indicator are revolution counters actuated electrically from the propeller shafts. These counters do not give the instantaneous speed of the engines, but by cutting in a pointer and letting it run for thirty seconds or a minute the propeller speed may be obtained.

Distance Recorder

Speed Indicator

WHISTLE

Controls for the hand siren and the hand and electric whistles are also located on the forward bulkhead of the pilot house.

SPEED SIGNALS

For advising other vessels of the fleet what one's engines are doing a system of speed cones is employed by day, the various positions either with the apex of the cone up or down telling what speed the engines are making and their direction. At night a light is displayed at the main truck, white for ahead and red for astern. Pulsations of this light tell the speed of the engines. An automatic truck light controller is installed in the pilot house, which, upon placing the pointer at the proper indication, will automatically show the desired signal on the truck light.

VOICE TUBES

Voice tubes are led from the pilot house to the standard magnetic compass in the mast, to the bow for handling the anchor gear, to the electric distribution rooms, to the engine control room, to the quarter deck, to the captain's and the navigator's emergency staterooms and the chart house, to the foot of the foremast, to the radio rooms, to the signal bridge, to the range finder on top of the pilot house, to the radio compass, and to the communication office. These voice tubes are fitted with call bells and supplement the ship's service telephone system and the maneuvering telephones with which communication may be had to nearly all the stations above mentioned.

PELORUS

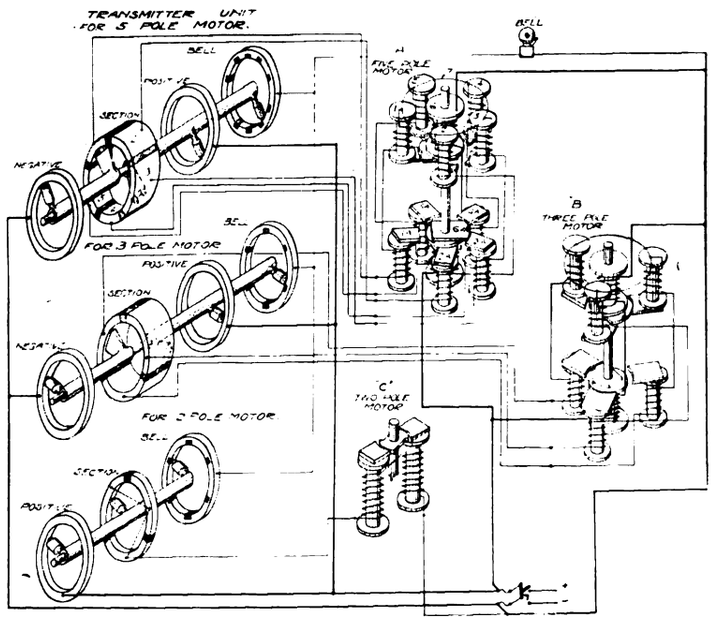
On the bridge outside of the pilot house are two gyro repeater compasses installed in pelorus stands, one on either side. These compasses are fitted with azimuth circles and

Generated on 2024-09-12 11:25 GMT / https://hdl.handle.net/2027/mdp.39015080127403
Public Domain, Google-digitized / http://www.hathitrust.org/access_use#pd-google
Digitized by Google
Original from UNIVERSITY OF MICHIGAN

alidades for taking bearings. Each stand also carries a bracket in which may be mounted a small range finder for taking distances in formation and other small ranges. It is quite essential that the distance to the ship ahead be known at all times in order that the engines may be kept at the proper speed to maintain the standard distance. A stadimeter, the invention of Rear Admiral Bradley A. Fiske, U. S. N., is also furnished vessels for measuring distances. This instrument measures the angle subtended by the masthead height above the waterline. Knowing this height, the stadimeter is calibrated to read in yards. An adjustment is fitted for setting various masthead heights.

Life-Buoy Releasing Gear

On either side of the bridge are two life-buoy release keys which enable the Franklin life-buoys on the quarters



Elementary Wiring Diagram for Electric Telegraphs, Rotary Type

to be let go from the bridge. These electric keys operate the solenoids of the release mechanism at the buoys.

Lights

A running light panel which controls all the running, anchor and peak lights is mounted on the cage mast.

The running lights comprise the side, masthead and towing lights, range light, stern light, steering light, wake light and screened speed light. The steering light is a minute light mounted on the jack staff for use in making turns in formation at night. The wake light shines down on the wake immediately astern of a vessel and gives information to the vessel astern when changing course.

Anchor lights comprise the forward and after anchor lights, the boom lights and the gangway lights.

The peak lights comprise the absentee lights, man-of-war lights, breakdown and man-overboard lights, and the flag lights. Absentee lights are white lights arranged one over the other abaft the mainmast and vary in number from eight for the President of the United States to one for the captain of a vessel. They indicate that the official or officer is ashore but will return within twenty-four hours. Man-of-war lights are two vertical white lights shown when a man-of-war is approaching an anchorage and displayed by anchored men-of-war when seen on an incoming vessel. Breakdown lights are two vertical red lights displayed by a vessel in formation when she is out of control. When the upper of these two lights is pulsated it indicates man overboard. Flag lights are two horizontal white lights displayed abaft the mainmast and indicate the presence of a flagship.

Telephone System

On the cage mast is a transmitter for the general announcing telephone system. This telephone allows orders, bugle calls, etc., to be transmitted throughout the vessel and announced in the various compartments. A buzzer of a peculiar tone is also fitted in this system as a signal for closing watertight doors.

At the rear of the bridge is the smoke telegraph by which the firerooms are notified to make smoke for screening purposes or to stop making smoke.

Anchor Telegraph

The great distance from the bridge to the bow on our new vessels has caused the installation of an anchor telegraph. This enables the bridge to signal the boatswain at the bow when to let go and how much chain to ride at and also to ask questions and receive answers concerning the ground tackle.

Docking Telegraph

On top of the pilot house are two docking telegraphs which signal electrically to the deck aft how to handle lines in coming alongside a dock.

A large range finder is also fitted on top of the pilot house for taking long ranges. A voice tube leads to the pilot house.

Signals

On the signal bridge are the racks for signal flags with halyards leading to the foreyard arms. Blinker signal keys are also installed here for operating the blinker lights at the ends of the yardarms. Signals are sent using the Morse code, the keys being arranged like telegraph keys. The circuits are arranged so that the same signal may go out from all four blinker lights or four different messages may be sent simultaneously.

Searchlights

Two 24-inch high-powered signal searchlights are placed on the signal bridge for distant signalling. They are fitted with signal shutters so that signals may be transmitted by the Morse code. Two 12-inch portable searchlights are also provided for short range signalling.

Synchronous Type of Motor Employed

So many instruments of the synchronous motor type are employed that it may be interesting to describe the action of this type of motor. The elementary wiring diagram shows typical layouts with a transmitter and an indicator at each end for five, three and two pole motors. The indicator consists of magnets arranged equidistantly about a polarized armature which is free to rotate under the action of the magnets as the latter are energized from the transmitter. The latter is arranged so that as the handle is moved from one indication to another the circuits to various magnets in the indicator are completed and the indicator armature is pulled around to correspond to the transmitter indication. When the transmitter handle is moved a bell is rung at the indicating station. This type of motor is also made to indicate twenty positions with five poles by reversing the polarity of the fields and varying the number of poles energized at a time. Very little trouble is experienced with this type of motor when properly made, as it is self-synchronous and so cannot get out of step, takes little power and is very reliable. Most of the instruments of this type used in the Navy are manufactured by Charles Cory and Son under their various

(*Continued on page* 202.)

Generated on 2024-09-12 11:26 GMT / https://hdl.handle.net/2027/mdp.39015080127403
Public Domain, Google-digitized / http://www.hathitrust.org/access_use#pd-google
Digitized by Google
Original from UNIVERSITY OF MICHIGAN

Application of Lubricants*

Where and How to Apply the Lubricant on Marine Machinery

OF equal importance to the selection of oils is the reliability of their method of application. There is a close relationship between the conditions under which an oil must serve its purpose, and the manner in which the oil is applied to the parts to be served. The various methods or systems by which oils are applied to the internal parts, generally termed cylinder lubrication, are as follows:

Hand Oiling.—Oil is applied by hand at intervals by means of an oil can, a hand oil pump or an oil swab or grease is applied through specially designed cups or by hand.

Drop Feed Oiling.—Oil contained in individual drop oilers is supplied at a regulated gravity action. The air compressor oil cup automatically supplies oil by air compression pressure.

Splash Oiling.—Oil contained in an enclosed chamber is splashed to parts requiring lubrication by the dip of a moving part of the machine.

Hydrostatic Lubricator.—Oil contained in a lubricator is discharged through an oil feed pipe by water displacement. The water is obtained from steam condensation.

Mechanical Force Feed Lubricator.—Oil contained in a lubricator is forced to the moving parts by one or two plunger pumps driven off some moving part of the engine or machine.

Knowledge of your lubrication problem will show the need of the proper method of application to suit the requirements of your special type of equipment.

Cylinder Lubrication

For the internal lubrication of:

(*a*) Steam engines and pumps;
(*b*) Diesel engines;
(*c*) Surface ignition oil engines;
(*d*) Air compressors;
(*e*) Refrigerating machines.

Steam Engines and Pumps

Cylinder lubricants are applied by the following systems:

(1) Oil cups (formerly known as "tallow cups");
(2) Hand oiling, i. e., swabbing the piston and valve rods;
(3) Hand pumps;
(4) Hydrostatic lubricators;
(5) Mechanical force feed lubricators.

(1) Oil cups, usually made of brass, some with two plug cocks, others with a screw top cover with one valve at the base, are attached on the top of cylinder or valve chest covers. The cup is filled with cylinder oil and then closed; and by opening the cock or valve at the base of the cup, the oil is permitted to flow into the cylinder or steam chest, as the case may be. This method is unsatisfactory, for it is spasmodic and wasteful, in that it requires too much attention.

(2) Hand oiling, swabbing the rods with cylinder oil, serves a lubrication purpose as far as the rods and rod packings are concerned, but this method of application is not satisfactory for cylinder and valve lubrication. Here again, the lubrication is spasmodic and uncertain, with the possibility of comparatively large doses of oil going out with the exhaust steam, which is the *main thing* to be avoided in marine practice.

(3) Hand oil pumps are sometimes installed, for use when starting an engine, and also when the engine is operating and there is a tendency for any of the internal parts to squeak or groan, as sometimes happens. But the hand oil pump is dangerous in the hands of a novice, because of the temptation to pump in more oil than is actually required, with the result that the excess oil goes out in the exhaust steam to the condenser. When it is found necessary to use the hand pump, judgment and care must accompany its use.

(4) The hydrostatic lubricator is one commonly used for the internal lubrication of marine steam engines. The lubricator is connected to the main steam pipe by suitable piping and valves. The principle of operation is as follows:

The body of the lubricator is filled with oil. Steam enters the condenser at the top of the lubricator, and is condensed. The interior construction is such that the condensed steam falls to the bottom through a small internal pipe. There is a pressure in the lubricator due to the pressure of steam in the main steam pipe, and an additional pressure due to the head of water in the condenser and piping above the body of the lubricator. The counter pressure at the outlet connection of the lubricator, into the main steam pipe, is that due to the pressure of steam in the main steam pipe. It is the unbalanced pressure due to the hydrostatic head, together with the fact that oil is lighter than, and floats upon, the water of condensation collected in the oil container, which causes the oil to rise and overflow into a small discharge pipe connected to the feed control valve at the base of the sight feed glass.

By the adjustment of the control valve, the oil is fed drop by drop at a certain rate, proportional to requirements for any given case. As the oil is used the water of condensation accumulates, until the body of the lubricator is emptied of oil, and becomes filled with water. The water is drained out and the lubricator refilled with oil, and the same cycle of operations is repeated.

The hydrostatic lubricator is not automatic in action, because it must be started and stopped by hand. Neither is it absolutely regular and uniform in its delivery of oil, as changes in temperature of the surrounding air, leakage or a slight obstruction in the small delivery tube passage will change the adjusted rate of feed, and in some cases the feed will stop. The hydrostatic lubricator requires close watching for best results.

(5) The mechanical force feed lubricator is essentially a small plunger force pump, contained in an oil reservoir, and driven by a lever and ratchet motion, actuated by some moving part of the engine. It is automatic, absolutely regular and sure in the delivery of oil, and its stroke may be adjusted to deliver within its range any desired quantity of oil in any period of time. Temperature changes have no effect whatever with this type of lubricator, and when once adjusted it requires no further attention other than to replenish the oil.

For best results, an atomizer is used with the force feed lubricator. The lubricator may be attached to any convenient part of the engine, and a pipe connection made to the main steam pipe, at a point a few feet back from the engine stop valve with a non-return check valve located at each end of the oil pipe. This point of connection is chosen in order to give the steam rushing through the pipe an opportunity to break up the drops of oil delivered through the atomizer. Thus the steam carries the oil in spray form to all internal moving parts of the engine. With a correct adjustment of the pump plunger, not any more oil than is actually required for lubrication will be delivered.

With this type of lubricator, a perfect control of the feed

*From *The Compass*, published by the Vacuum Oil Company, New York.

Generated on 2024-09-12 11:22 GMT / https://hdl.handle.net/2027/mdp.39015080127403
Public Domain, Google-digitized / http://www.hathitrust.org/access_use#pd-google
Digitized by Google
Original from UNIVERSITY OF MICHIGAN

is attainable at *all times,* and delivery of oil takes place only while the engine is operating.

The steam cylinders of auxiliaries and pumps are supplied with lubrication in the same manner as that described for the main units. The usual method in marine practice being by swabbing the rod, although the hydrostatic lubricator is sometimes employed.

DIESEL ENGINE

Cylinder lubricants for Diesel engines are applied by the force feed method, in which the mechanically operated force feed lubrication, already described, is employed. The lever movement may be actuated by an eccentric on the cam shaft, or receive motion through connection by a driving rod attached to some moving part of the engine.

The cylinders are lubricated by providing multiple force feed pumps with feeds to supply all the cylinders, one plunger for each cylinder and one plunger for each air compressor cylinder. In some engines, two, three or four plungers for each cylinder are provided, separate oil leads being introduced at different points around the cylinder. In some instances the supply from one plunger pump is applied to an oil pipe encircling the cylinder having 2, 3, or 4 leads. With this arrangement it is possible that the oil supply may be unequally distributed, and lubrication will be deficient; therefore, one lead from each pump to each cylinder may be considered the only reliable practice. Check valves are placed in the outlet end of each oil lead in order to maintain a full oil pipe. The leads should be so placed and connected that oil will be fed between the first and second piston rings when the piston is at the bottom of its stroke.

SURFACE IGNITION OIL ENGINES

Oil is supplied under pressure from a mechanically operated force feed lubricator in which there are a number of small independent plunger pumps, each having a pipe or tube to conduct the oil to the desired point of introduction in the several cylinders. It is desirable to have these leads supply one point only, i. e., not branched to two or more points, because it is uncertain that the division of the supply of oil in such cases is equal.

Oil should be supplied to the piston of large engines at several points in its circumference and each of the leads should be served by an independent pump plunger in the lubricator. Smaller engines do not need as many points of application. A check valve is placed in each oil lead, as before referred to in Diesel engines. For the best effect, the stroke of the pumps should be timed to deliver the oil between the first and second piston rings at the instant the pistons are at their extreme outward travel (the bottom end of stroke).

AIR COMPRESSORS

Oil is usually applied to the air cylinders by means of an air compressor sight feed drop oiler attached to the cylinder in a vertical position. It consists essentially of an oil container, a feed regulating valve and a ball check. In operation, the main valve is open wide, admitting air pressure to the container, and the regulating valve is adjusted to the desired rate of oil feed. The oil thus admitted to the cylinder is distributed over its walls and the frictional surfaces of the valves.

The definite method for supplying cylinder lubrication is by means of the mechanically operated force feed lubricator. The number of feeds required depends upon the size of the compressor. With such a lubricator the oil feed, once adjusted, remains constant and permits regulation for a necessary minimum rate of feed, avoiding the possibility of over-lubricating, which is one of the principal causes for carbonization on the voluntary discharge valves.

Feeding Oil Direct.—As a rule, it is best to feed the oil sparingly, uniformly and directly to the frictional surfaces. In horizontal compressor cylinders, the lubricating oil is usually introduced through one lead at the top and at the center of the cylinder. The oil is spread internally by the moving piston and forms the required complete sealing and lubricating film.

Vertical compressors with single acting trunk pistons may be lubricated by means of the splash oiling system, whereby a moving part of the machine dips into the oil in the crank case, producing an oil spray that reaches all parts. It is of greatest importance that a constant oil level be maintained in the crank case, for if the oil level is too low the oil spray will be insufficient and some of the parts will be "starved." If the level is too high, there will be too much splash and an excessive supply of oil will work past the piston rings and will lodge on the voluntary discharge valves. This will result in the carbonization of the oil under the extreme heat of compression, causing the valves to stick.

REFRIGERATING MACHINES

Cylinder lubrication of various types and kinds of refrigerating machines is accomplished by feeding oil to the center of the rod stuffing box. The stuffing box is much deeper than is required for steam engines and contains two sets of packing rings, separated in the center of the depth of the box by what is called the "lantern." The lantern serves a double purpose, namely, it forms a small reservoir for gas that leaks out from the cylinder and also serves as a container for the lubricant. There are usually two pipes connected into the lantern, one for introducing the oil, the other for withdrawing the gas—the latter pipe is connected to the suction side of the machine. In some installations, the oil is fed to the stuffing box by an ordinary sight feed oil cup, or by a small hand pump used intermittently at the discretion of the operator.

For carbon dioxide machines, when high compressor pressures are encountered (1,000 pounds per square inch), the mechanical force feed lubricator is employed. The movement of the rod back and forth, or up and down, as the case may be, carries the oil with it, thus lubricating effectively the rod packing and some of the lubricant is carried into the cylinder of the compressor, lubricating the walls and piston rings at the same time.

It is considered that sufficient cylinder lubrication may be obtained from that which is drawn into the cylinder by the movement of the piston rod, as most of the refrigerants used are somewhat of a lubricating nature, and it is desirable to have as little oil in the system as possible.

Ship Control on Modern Battleships

(*Continued from page* 200.)

patents, although other manufacturers have lately appeared in the field with similar instruments.

The telegraphs are mounted as pedestal or bulkhead instruments. Some are similar in appearance to telegraphs of the mechanical type, and others are made with the transmitter actuated in the face of the instrument.

CONCLUSION

To keep all of these instruments, lights and call bells in efficient operating condition requires the services of a good many men, but the safety of the vessel is so dependent upon their operating correctly when needed that no effort is spared on their upkeep.

The bridge equipment of a man-of-war may seem too elaborate to an officer in the merchant service, but it is hoped that the foregoing has shown the necessity for all the equipment used.

Generated on 2024-09-12 11:21 GMT / https://hdl.handle.net/2027/mdp.39015080127403
Public Domain, Google-digitized / http://www.hathitrust.org/access_use#pd-google
Digitized by Google
Original from UNIVERSITY OF MICHIGAN

Relationship of Rail and Water Carriers*

Wide Piers and the Best of Mechanical Devices Needed for Closest Possible Liaison Between Land and Water Carriers

By William J. Wilgus

IN times when an impoverished world is practicing rigid economy as never before it is to be expected that trade between nations will flow along paths of least resistance and hence through those gateways which, other things being equal, exact the least tribute in tolls and time from the rail and water carriers which meet there for purposes of interchange.

Pier a Joint Terminal

The usual pier or quay after all is a joint terminal not only for the ship but likewise for the railroad and for the motor truck. Unfortunately too often this common ground is under the exclusive jurisdiction of one of these agencies, with dire results to the others. For instance, a steamship line in sole possession of a pier will seldom, if ever, provide proper space upon it for tracks on which the railroads may place their cars for delivering and receiving freight direct, when it may dictate to the railroads, without expense to itself, that the interchange shall be effected through the medium of trucking or of floating equipment with its added cost of breaking bulk and of tortuous waterfront and marine operations. This is the situation that obtains today in our greatest port, New York, originally brought about by natural conditions that ante-dated the railroad era, and later perpetuated through the provision in the seaboard rate that requires the railroad to interchange freight at shipside rather than at the end of the rail-haul.

The unification of the management under joint control, of rail and water terminals in the waterfront zone of each port is essential to a full solution of the port problem. With this should go a coordinating belt line under the jurisdiction of the port management; an "open door" for the vast fleet of independent craft that is unpossessed of exclusive facilities —leased or owned; and working arrangements with the trunk lines whereby freight consigned to the port shall be suitably grouped at distant clearing yards for movement direct to the particular location for which it is destined, without the need for intermediate reclassification or breaking bulk. There is much room for improvement through a further restriction of free storage which is now a wasteful burden on the rail carrier. Ample warehouses and open storage areas adjoining the piers and quays, with moderate charges, would go far to decrease this evil.

The wastefulness of this process can be best illustrated by comparing it with the confusion, delays and excessive costs that would reign in a joint railroad terminal where differing gages of the main lines and yard tracks would make necessary the breaking of bulk or transfer of car bodies in transit, within sight of final destination, a condition too absurd for serious consideration.

Wide Piers Necessary

The remedy for this manifestly unhappy situation lies in the converting of port authorities and carriers, both rail and water, to the wisdom, or rather strict necessity, of abandoning the stingy pier policy and of building generously proportioned wide piers and quays on which there shall be ample space for transit and storage sheds, motor truck driveways and track layouts designed for continuous cargo handling uninterrupted by switching operations. All of the great ports of the Old World, and even the principal ones of South America and of our neighbor on the north, Canada, have taken this foresighted course, and in this country the more progressive of our ports have rather timorously done likewise. But there are many of our ports, notably New York, where the narrow pier policy still rules. In planning for the future, then, let us remedy our past faults and substitute wide piers for the inefficient and wasteful narrow, trackless ones which we have inherited from the days of the sailing ship and canal boat.

Another direction in which there is a burning need for improvement is the more extended employment of mechanical equipment for reducing the expense of cargo handling and for expediting the release of ships and cars.

For example, in the World War the American Army in France operated in from twenty to thirty ports at which in the last month of the war, November, 1918, were discharged, by a variety of methods, nearly a million tons of supplies at an average rate of 449 tons per ship per day, or approximately one and one-tenth tons per lineal foot of ship berth per day. At one of these ports, American Bassens, there had been completed at that time a partial installation of electric gantry cranes which despite many handicaps, such as untrained operators, poor lighting facilities, shortage of cars and stevedores and insufficient "tuning up," made an average record of 717 tons per ship per day, equal to one and eight-tenths tons per lineal foot of ship berth. This was in marked contrast to the 371 tons per ship, or nine-tenths of a ton per lineal foot of ship berth, discharged daily at the neighboring berths where the non-completion of the gantries made necessary the handling of similar cargoes by ship tackle not only with less speed but also with greater damage to the supplies, and with much more rehandling between ship, car and shed by reason of the shorter radius of action of the ship tackle.

A Job for the Shipping Board

Relief in all these particulars would appear to be hopeless unless some competent central governmental agency, clothed with power, shall vigorously take up the problem in all its phases, commercial and military, with the determination promptly to find and enforce the application of remedies. It is idle to expect that the ship interests and the many railroads will make any substantial united progress in that direction.

Under Section 500 of the Transportation Act of 1920 the

*Paper presented before the American Society of Civil Engineers

Generated on 2024-09-12 11:21 GMT / https://hdl.handle.net/2027/mdp.39015080127403
Public Domain, Google-digitized / http://www.hathitrust.org/access_use#pd-google
Digitized by Google
Original from UNIVERSITY OF MICHIGAN

duty is placed upon the Secretary of War to investigate this very problem in harmony with the declared policy of Congress "to promote, encourage and develop water transportation service and facilities in connection with the commerce of the United States, and to foster and preserve in full vigor both rail and water transportation." Along with this it is the duty of the Interstate Commerce Commission in the interest of the country at large, now called upon to underwrite the return on railroad investments, to look into and correct matters that affect the operating expenses of the railroads which are burdened with much of the wasteful practices at our ports, from which waste the water carriers, often flying a foreign flag, are reaping benefit. Then it should not be forgotten that as a people we are vitally interested in the provision of efficient ocean port terminals for our gigantic merchant marine, as to which it is the duty of the Shipping Board to take action.

LETTERS TO THE EDITOR

Wear of the Teeth of Marine Turbine Reduction Gears

The writer has read with keen interest Mr. F. W. Dean's letter under the above title in the February number of Marine Engineering and Shipping Age and agrees with Mr. Dean that it is unfortunate that such refined workmanship is necessary on marine reduction gears.

However, in view of the fact that friction is always the cause of wear regardless of what the material, whether the hardest diamond ever found or the softest lead, we may as well take it for granted, right now, that there will *always* be wear in reduction gears whether made for marine use or for stationary service. As soon as wear is eliminated, according to the writer's viewpoint, we will have a transmission efficiency of 100 percent.

One way to get around the wear evil, to be sure, is to eliminate gears altogether and use the electrical reduction method, but, no matter what the extent of the development of the electrical method, it is quite likely that there will always be a demand for and a field for the geared method.

There are several reasons why the herringbone type of gear is so popular—reasons why, probably, no better gear reduction method will ever be developed. The slanted tooth is less noisy than the straight line tooth. When the De Laval geared turbine first came out the writer remembers that a great hullabaloo was made about the noises generated in addition to the power. It was claimed by some engineers at that time that the reduction gear would never be a success on account of the noise feature alone. The slanted tooth is also stronger than the straight line tooth—not so liable to break off. A tooth is only a cantilever beam. By relieving this beam of shock, as is done by slanting the beam, the breakage danger is lessened. Also, the end thrusts are taken care of, alinement collars and bearings becoming automatically eliminated.

This latter advantage is considered a disadvantage by Mr. Dean and it doubtless is a disadvantage in the matter of wear, but I cannot see that conditions would be bettered by making the teeth straight as far as wear is concerned. Let us assume that with straight tooth reduction gears ample room would be allowed for side-play. After the very first day of usage we would have some wear because there would be some friction. Then we would move the pinion over one-half inch to prevent the pinion from "wearing a groove for itself" in the large intermeshing gear. However, even after the first day we would no longer have a "perfect fit" nor as good a fit as was had on the first day because a part of the large gear would be used that was not worn on the previous day and that part would place greater pressure on the pinion tooth end than was encountered during the entire first day. Consequently the ends of the pinion would wear down first and regardless of sliding back and forth to "even up" the wear we would find the pinion "wearing a groove for itself."

In talking to a large user of reduction gear turbines not long ago that user remarked: "No matter how accurately the gears are machined they'll never get away from the fact that steel is elastic, that all kinds of metals are elastic, and that the elasticity is great enough to throw all of their wonderful *theory* into the scrap heap." He may have exaggerated the case a bit, but there is a "mountain" of truth in what he said nevertheless.

As for making the large gears out of cast iron and the pinions out of steel, that sounds plausible to the writer. I do not know why it is not done nor do I know if it has been tried on high power reduction drives.

New York. N. G. Near.

The Future in the Shipbuilding Industry

The Armament Conference and its results while canceling many valuable contracts are only part of the reaction expected in the munition and allied trades by every reasonably thoughtful engineer after the war came to an end. It is a natural and not an abnormal condition. Whatever may be said of the great and acknowledged evils of militarism like everything else they had certain compensations. The huge navies of the past have left behind them large industrial plants and produced coaling and repair facilities, charts and other aids to navigation in extended and remote quarters of the world, and their staffs have advanced mechanical construction to perfection by a lavish expenditure on experiments that private enterprise would have been entirely unable to afford.

So much we have as a tremendous legacy today on which to build prosperity in the future.

The world is not bankrupt but its books are tangled up. Its purchasing power as a whole is measured by raw materials for barter and by the needs and numbers of its citizens, which have not been very materially reduced.

The money represented by interest on war bonds goes into some people's pockets and, if the pages of history are an accurate guide to the future, will be spent sooner or later in such luxuries as trips to Europe, yachts, and in permanent investments. There is possibly danger of excessive spending, for unfortunately few can resist the corrupting influence of wealth as experience has shown in both ancient Rome and modern India.

We desire a mercantile marine. Canal dues are complicated by treaty stipulations and subsidies confronted with political difficulties. If tourists were compelled to return in our own ships to obtain entry, it might help things somewhat. Also where there is no probability of displacing American labor our otherwise idle shipping might operate between Asiatic ports with Asiatic crews as the only method of competing with foreign vessels employing Lascars.

Vallejo, Calif. C. E. Burnley.

A Correction

In the article describing the American motorships *Californian* and *Missourian*, published in our February issue, it was erroneously stated that the steering gear was furnished by the Hyde Windlass Company. The electro hydraulic steering gear installed on both the *Californian* and *Missourian* is the A-E-Co Steerer furnished by the American Engineering Company of Philadelphia. The windlasses on both these vessels were also furnished by the American Engineering Company.

Generated on 2024-09-12 11:27 GMT / https://hdl.handle.net/2027/mdp.39015080127403
Public Domain, Google-digitized / http://www.hathitrust.org/access_use#pd-google
Digitized by Google
Original from UNIVERSITY OF MICHIGAN

Questions and Answers for Marine Engineers

Inquiries of General Interest Regarding Marine Engineering and Shipbuilding Will Be Answered in This Department

Conducted by James L. Bates

This department is maintained for the service of practical marine engineers, draftsmen and shipbuilders. All inquiries should bear the name and address of the writer. Anonymous communications will not be considered. The identity of the writer, however, will not be disclosed unless the editor is given permission to do so.

Is Superheated Steam a Perfect Gas?

Q. (1149).—I am informed that steam heated to 1,000 pounds is nearly a perfect gas. Is there any sense to that statement?

A. (1149).—Such information as is available seems to indicate that at high degrees of superheat and pressure the characteristics of steam approach those of a perfect gas.

Probable Earnings of the Leviathan

Q. (1150).—Can you furnish information as to the probable earnings of the ex-German steamship *Leviathan* in case she were reconditioned and put into the Atlantic passenger service?

A. (1150).—Conditions in the Atlantic passenger trade are somewhat unsettled at the present time, owing to the world-wide business depression and to the readjustment which is taking place on both sides of the Atlantic. The following information, which is quoted from the Atlantic Coast Shipbuilders' Association Bulletin for January 27, 1922, is believed to give as satisfactory a statement for your purpose as is possible under the conditions:

"The probable gross earnings of the *Leviathan* would be $500,000 a voyage, against disbursements of $350,000 per voyage, according to an official of the Emergency Fleet Corporation, figuring out to a net earning of $150,000 per voyage. The figures are based on filling, on the average, of one-third of her total passenger accommodations throughout the year, on carrying a certain rate of mail and on certain other sundry earnings from baggage and so forth. The same official said she ought to earn $150,000 a voyage for fourteen voyages a year. He points out that there must be taken into consideration deductions from net revenue of $250,000 for dry docking and lay-up cost, interest at 5 percent and depreciation. Reconditioning cost of $6,697,303, $1,502,697 for trial trip, insurance and inspection would amount to $1,206,666 annually."

Thickness of Shell Plating in Shallow Draft Vessels

Q. (1151).—What do you regard as the considerations governing the thickness of shell plating in vessels built for use in shallow water?

A. (1151).—In vessels of this class draft and therefore, weight of structure are of the first importance. If the vessel is to be restricted in its use to the inland portions of rivers, the provision against local damage such as grounding and the necessary allowance for corrosion, would be important considerations, both of which are antagonistic to extreme lightness of plating. The character and distribution of cargo and the conditions of navigation, such as current, obstructions, etc., should also be studied. If, however, the vessel is to be used in the mouths of large rivers or along the coast where heavy swells may be encountered, it is necessary to consider the effect of waves upon the ship girder. In this case, in addition to the considerations mentioned above, the ratio of frame spacing to plate thickness is important. The value of this ratio in certain cases with which the writer is familiar may be obtained from the following table:

Ship No.	Length, Feet	Frame Spacing, Inches	Plating Thickness Midships	Ratio of Frame Spacing to Plate Thickness
1	144	18	.22	82
2	176	20	3/8	53
3	167	18	1/4	72
4	200	18	5/16	57
5	160	20	1/10	200

The last ship, No. 5, is a war vessel and represents an extreme which it would be unwise to approach in commercial practice.

Professor Hovgaard in his "Structural Design of Warships," under the heading "Longitudinal Strength," presents a discussion on the subject of bending which is of value in connection with the above.

Pitting of Shafting and Hull Plating

Q. (1146).—We are troubled with pitting of shafting and plates on hulls tied up at our piers, which we attribute to "electrolysis." Can you give us some information on this sort of trouble or recommend some literature pertaining to it?

A. (1146).—The information given is hardly sufficient to permit of more than a very general reply.

In practice that part of the propeller shaft within the stern tube is generally covered with brass liners and the tube is always full of sea water. Electrolytic action takes place between the brass and the iron in consequence of which the latter often becomes deeply corroded close to the end of the liners. On this account United States naval practice formerly required the fitting of zinc plates on the rudder, sternpost, shaft struts and shaft tubes, and zinc rings around composition sea chest openings. The zinc rings now have been superseded by medium steel rings and doubling plates, which serve to provide an excess amount of electro-positive material which can be readily removed when corroded. The use of zinc plates on the rudder, sternpost, etc., has been abandoned generally, since experiment has shown no injurious effect due to their omission.

It is to be assumed, of course, that such precautions as the above have already been taken. If this is the case, it may be that, for one reason or another, the water around your piers contains certain acids which greatly strengthen the electrolytic action. Chemical analysis of a sample might then prove of value.

Comment on the corrosion of metals under varying conditions may be found in the following:

"Corrosion and Preservation of Iron and Steel" by Cushman and Gardner.

"Practical Shipbuilding" by Campbell Holms, Edition 1918, Vol. I, Articles 566 and 569.

"Shipbuilding Cyclopedia," Edition 1920, Dictionary Section, under the term "Wrought Iron."

Generated on 2024-09-12 11:22 GMT / https://hdl.handle.net/2027/mdp.39015080127403
Public Domain, Google-digitized / http://www.hathitrust.org/access_use#pd-google
Digitized by Google
Original from UNIVERSITY OF MICHIGAN

PERSONAL MENTION

JOSEPH W. POWELL, president of the Emergency Fleet Corporation, has resigned his connection with the corporation to take effect this month.

REAR ADMIRAL ROBERT S. GRIFFIN, U. S. N. (retired), has recently become associated with Commander William L. Cathcart, U. S. N. R. in marine and naval engineering consulting work at 149 Broadway, New York. Until his retirement in September, 1921, Admiral Griffin had been for about eight years Engineer-in-chief of the Navy and Chief of its Bureau of Engineering (formerly Bureau of Steam Engineering). In addition, he had been for nearly five years previously, Assistant to the then Engineer-in-chief, so that his intimate association with, or personal direction of the technical and financial affairs of this most important Bureau have covered a continuous period of more than thirteen years, during which every combatant vessel now in our Navy was either designed or built. This period also covered the duration of the world war in which our Navy grew to a strength of 600,000 men and had nearly 2,000 vessels of all classes in commission, of which eventually we had in European waters a total of 338 ships, carrying 5,000 officers and 70,000 enlisted men. To the tireless energy of Admiral Griffin and his staff, at Washington and in our various Navy Yards, is due the fact that, throughout the whole war, no major vessel of the Navy was ever delayed by repairs to her machinery. An outline of the Bureau of Engineering's field prior to and during the war will give some conception of the magnitude of this work. That field covered all steam, all electrical and all internal combustion engines for the propulsion of naval ships; the bulk of the electrical apparatus for surface ships, submarines and aircraft; the machinery for aircraft; the generation and supply of gas for observation balloons and dirigibles; and finally extended radio telegraphic work in the design and supply, during the war, of the entire wireless equipment of all shore stations in the United States, in our island possessions and on every vessel, merchant or naval, flying the American flag. On September 1, 1921, all aircraft equipment—machinery, electrical apparatus and balloon gases—was transferred to the new Bureau of Aeronautics. Admiral Griffin was born at Fredericksburg, Va. He was educated in the private schools of that historic town and at the U. S. Naval Academy. After graduation at Annapolis in 1878, his early years in the Navy were spent in engineering duty afloat and ashore. His sea service ended in 1905, when he was acting as Fleet Engineer of the Atlantic Fleet, an assignment which had followed a similar one in the European squadron. From then onward, he served almost continuously in either the design or the construction of naval machinery, until he assumed office as Engineer-in-chief and chief of the Bureau of Engineering. The Admiral was awarded the Sampson Medal for his services in the Spanish-American war and also the U. S. Distinguished Service Medal for his work during the world war. The French Government made him a Commander of the Legion of Honor in recognition of his services to the Allied cause. He was granted the honorary degree of Doctor of Science by Columbia University and of Doctor of Engineering by the Stevens Institute. He is a member of the National Research Council and an Honorary Member of the American Society of Mechanical Engineers.

Rear-Admiral R. S. Griffin, U. S. N.

COMMANDER WILLIAM L. CATHCART, U. S. N. R., associated with Rear Admiral Robert S. Griffin in consulting work, was educated at the University of Pennsylvania and at the U. S. Naval Academy. After his graduation at Annapolis, he served for sixteen years in the former Engineer Corps of the Navy, afloat and on inspection duty ashore. He then resigned to enter private business. Later he became Adjunct Professor of Mechanical Engineering at Columbia University, then served for some years on the scientific staff of the Babcock and Wilcox Company and is now Professor of Engineering at the Webb Institute of Naval Architecture, New York City. During the Spanish-American war, Professor Cathcart volunteered, was appointed a Chief Engineer in the Navy and was ordered to special duty at the Navy Department in confidential service under Admiral Melville then Engineer-in-chief. At the outbreak of the world war, he again volunteered, was appointed Lieutenant Commander, U. S. N. R., and served at the Navy Department as confidential aide to Admiral Griffin. He remained on this duty for nine months after the war closed. In recognition of his service, he was promoted to the rank of Commander on recommendation of the Board on Selection.

Commander W. L. Cathcart, U. S. N. R.

CAPTAIN F. L. IVERSON has been appointed to command the new passenger ship *Reliance* of the United American Lines. The *Reliance,* together with her sister ship the *Resolute* was recently purchased by the Harriman interests from the Royal Holland Lloyd Line. These boats will be used to maintain a fortnightly passenger service between New York and Hamburg with calls at French and English channel ports. At the present time Captain Iverson is in command of the United American Line passenger ship *Mount Clinton.* He will assume his new command about the first of March. Captain Iverson took command of his first ship in 1892. This was a foreign going sailing vessel operating out of New York. After seven years on various sailing craft he became associated with the American Line and served with their steamers for about seven years. For nearly ten years he commanded the pleasure yachts of several well known Americans. During the war Captain Iverson was in command of the transport *Liberator.*

Capt. F. L. Iverson

Generated on 2024-09-12 11:21 GMT / https://hdl.handle.net/2027/mdp.39015080127403
Public Domain, Google-digitized / http://www.hathitrust.org/access_use#pd-google
Digitized by Google
Original from UNIVERSITY OF MICHIGAN